This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

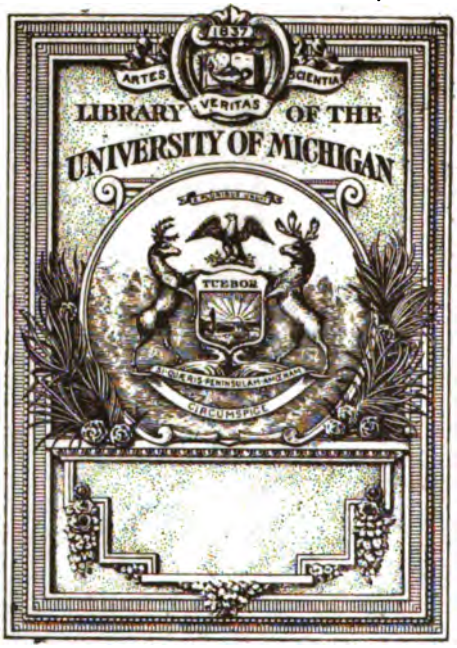
+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

B 3 9015 00208 418 7
University of Michigan - BUHR

Digitized by Google

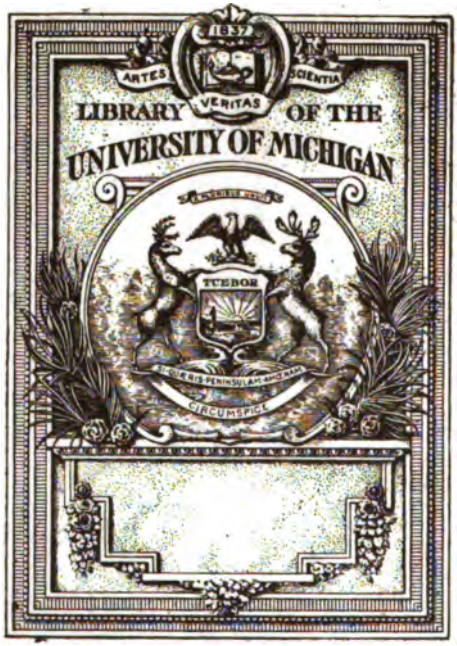


Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google



Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Carbuncle of the back, extending from one scapula to the other, opened by crucial incision, 8½ inches long and 3 inches deep. [*See page 176.*

Digitized by Google

INTERNATIONAL CLINICS

A QUARTERLY

OF

ILLUSTRATED CLINICAL LECTURES AND
ESPECIALLY PREPARED ORIGINAL ARTICLES

ON

TREATMENT, MEDICINE, SURGERY, NEUROLOGY, PÆDIATRICS, OBSTETRICS, GYNÆCOLOGY, ORTHOPÆDICS, PATHOLOGY, DERMATOLOGY, OPHTHALMOLOGY, OTOLOGY, RHINOLOGY, LARYNGOLOGY, HYGIENE, AND OTHER TOPICS OF INTEREST TO STUDENTS AND PRACTITIONERS

BY LEADING MEMBERS OF THE MEDICAL PROFESSION THROUGHOUT THE WORLD

EDITED BY

H. R. M. LANDIS, M.D., PHILADELPHIA, U.S.A.

WITH THE COLLABORATION OF

CHAS. H. MAYO, M.D.
ROCHESTER

SIR WM. OSLER, BART., M.D., F.R.S.
OXFORD

RUPERT BLUE, M.D., D.P.H.
WASHINGTON, D. C.

FRANK BILLINGS, M.D.
CHICAGO

JOHN G. CLARK, M.D.
PHILADELPHIA

A. MCPHEDRAN, M.D.
TORONTO

JAMES J. WALSH, M.D.
NEW YORK

J. W. BALLANTYNE, M.D.
EDINBURGH

CHARLES GREENE CUMSTON, M.D.
GENEVA

ARTHUR F. BEIFELD, M.D.
CHICAGO

RICHARD KRETZ, M.D.
VIENNA

WITH CORRESPONDENTS IN MONTREAL, LONDON, PARIS, BERLIN, VIENNA, LEIPSIC, BRUSSELS, AND GENEVA

VOLUME I. TWENTY-EIGHTH SERIES, 1918

PHILADELPHIA AND LONDON

J. B. LIPPINCOTT COMPANY

1918

Digitized by Google

COPYRIGHT, 1918
BY
J. B. LIPPINCOTT COMPANY

PRINTED BY J. B. LIPPINCOTT COMPANY, PHILADELPHIA, U.S.A.

Digitized by Google

CONTRIBUTORS TO VOLUME I

(TWENTY-EIGHTH SERIES)

BIGO, HENRI, M.D., Caudry, France.

BISCH, LOUIS E., A.B., M.D., PH.D., Formerly Director, Psychopathic Laboratory, New York Police Department; Associate in Educational Psychology, Columbia University; Visiting Neurologist, New York City Children's Hospital and Schools.

BISHOP, LOUIS FAUGERES, A.M., M.D., Clinical Professor of Heart and Circulatory Diseases, Fordham University School of Medicine, New York City; Physician to Lincoln Hospital.

BROWN, PHILIP KING, M.D., San Francisco.

CRAIG, FRANK A., M.D.

CUMSTON, CHARLES GREENE, B.S., M.D., Privat-docent at the University of Geneva; Honorary Member of the Surgical Society of Belgium; Fellow of the Royal Society of Medicine of London, etc.

FUNK, ELMER H., M.D., Philadelphia.

HAWES, JOHN B., 2D, M.D., Director, Department of Non-pulmonary Tuberculosis, Massachusetts General Hospital; Secretary, Board of Trustees, Massachusetts Hospital for Consumptives; Instructor in Medicine, Harvard Medical School, Boston.

KRETSCHMER, HERMAN L., M.D.

LAHEY, FRANK H., M.D.

LEE, W. ESTELL, M.D., Philadelphia.

LESPINASSE, VICTOR D., M.D., Chicago.

MURPHY, JOHN P. H., M.D., Assistant Physician, St. Elizabeth's Hospital, Washington, D. C.

POLAK, JOHN OSBORN, M.D.

SKILLERN, P. G., JR., M.D.

STEINHARDT, I. D., M.D.

WEBER, F. PARKES, M.A., M.D., F.R.C.P., London.

322239

Digitized by Google

Digitized by Google

CONTENTS OF VOLUME I

(TWENTY-EIGHTH SERIES)

CLINICS

CLINICAL LECTURE. By Louis Faugeres Bishop, A.M., M.D. 1

A CLINIC FOR THE TREATMENT OF NON-PULMONARY TUBERCULOSIS IN OUT-PATIENT AND DISPENSARY PRACTICE. By John B. Hawes, 2d, M.D. 16

GYNÆCOLOGIC CLINIC, LONG ISLAND COLLEGE HOSPITAL, OCTOBER 25, 1917. By Dr. John Osborn Polak 27

CLINIC OF VICTOR D. LESPINASSE, M.D., Wesley Memorial Hospital 47

REPORT OF A CLINIC HELD AT THE PRESBYTERIAN HOSPITAL AND RUSH MEDICAL COLLEGE. By Dr. Herman L. Kretschmer 54

SURGICAL CLINIC OF DR. FRANK H. LAHEY AT THE BOSTON CITY HOSPITAL, BOSTON, JULY 25, 1917 65

TWO LECTURES ON INJURIES TO THE CRANIUM AND BRAIN IN WARFARE—LECTURE II. By Charles Greene Cumston, B.S., M. D. 74

MEDICINE

CLINICAL MANIFESTATIONS OF THE VARIOUS JOINT AFFECTIONS AND THEIR BEARING ON DIAGNOSIS. By Philip King Brown, M.D. 93

HERNIA OF THE LUNG: WITH REPORT OF CASE OF SPONTANEOUS HERNIA OF THE RIGHT LUNG. By Elmer H. Funk, M.D. 102

SOME PATHOLOGIC CONDITIONS OF THE NAILS (VARIOUS FORMS OF LEUCONYCHIA, TRANSVERSE GROOVING, INCURVED NAILS WITH CLUBBED FINGERS, CONGENITAL INGROWING NAILS). By F. Parkes Weber, M.A., M.D., F.R.C.P. 108

NEUROLOGY

THE CRIMINAL MIND. By Louis E. Bisch, A.B., M.D., Ph.D. 131

THE THERAPEUTIC USE OF OCCUPATION IN THE TREATMENT OF THE INSANE. By John P. H. Murphy, M.D. 139

PUBLIC HEALTH

SEX HYGIENE AND ITS TEACHING. By I. D. Steinhardt, M.D. 156

Digitized by Google

SURGERY

THE SECONDARY SUTURE OF INFECTED WOUNDS AFTER THEIR CHEMICAL STERILIZATION WITH DICHLORAMINE-T. By Dr. W. Estell Lee 174

THE TREATMENT OF SHELL AND GUNSHOT WOUNDS. By Henri Bigo, M.D. 183

A GENERAL REVIEW OF MEDICINE

FOR THE YEAR 1917. By Frank A. Craig, M.D., and P. G. Skillern, Jr., M.D. 197

Digitized by Google

LIST OF ILLUSTRATIONS TO VOLUME I

(TWENTY-EIGHTH SERIES)

COLORED PLATES

PAGE

Carbuncle of the back, extending from one scapula to the other, opened by crucial incision, 8½ inches long and 3 inches deep ..... *Frontispiece*

Preparation of skin and unsutured portions of the wound on the twenty-eighth day (Fig. 7) 178

PLATES AND CHARTS

Examination blank (Fig. 1) 2

Family history blank (Fig. 2) 3

History blank, with diagram of heart (Fig. 3) 5

Bringing the "guy rope" attached to the loop of the round ligament beneath the utero-ovarian ligament (Fig. 1) 38

Both round ligaments brought behind uterus as a sling (Fig. 2) 38

Both round ligaments united across the back of the uterus (Fig. 3) 39

Testicle, epididymis, and cord obtained post mortem, showing absence of the tail and body of the epididymis (Fig. 1) 48

Left testicle obtained post mortem which shows the sequelæ of a previous epididymitis (Fig. 2) 48

Right testicle from the same individual as Fig. 2 (Fig. 3) 48

Schematic drawing of testicle and epididymis from Case I (Fig. 4) 49

Schematic drawing of the left testicle from Case II, which shows the lower half of the epididymis completely gone and replaced by a fibrous cord (Fig. 5) 49

Schematic drawing of the right testicle from Case II, showing the complete absence of the lower portion of the body and tail of the epididymis, the presence of adhesions at the previous site of the tail of the epididymis, and the complete absence of the vas (Fig. 6) 49

Shows the non-productive case (Fig. 7) 50

Stone exaggerated by dark line around it (Fig. 1) 66

Same as Fig. 1, but with radiographic catheter pointing to stone (Fig. 2) .. 66

Calcified gland in the radiograph, with catheter passing it (Fig. 3) 66

The shadow of the ureteral stone, with the tip of the radiographic catheter resting against its lower end (Fig. 4) 67

Photograph of the ureteral stone (Fig. 5) 70

Stone in the ureter, with radiographic catheter pointing to it (Fig. 6) 70

Chart IV 75

Chart V 76

Digitized by Google

Chart VI 77
Chart VII 79
Chart VIII 80
Chart IX 81
Chart X 82
Illustration showing region of anæsthetic injection into the cranium (Fig. 1). 85
Charcot joint in spine (Fig. 1) 96
Exostoses on spine (Fig. 2) 97
Rarefying lesion of patella (Fig. 3) 98
Syphilitic osteoporosis of skull (Fig. 4) 98
Rheumatoid arthritis; painful fusion of wrist-bones; nearly every joint in hands somewhat involved (Fig. 5) 99
Rheumatoid arthritis, woman of fifty-seven, showing hypertrophic and atrophic changes (Fig. 6) 99
Hand of same case as Fig. 9 at age of seventy-four (Fig. 7) 100
Recurrent osteo-arthritis—same case as Fig. 10—following walking exercise at time of San Francisco fire, 1906 (Fig. 8) 100
Same case as Fig. II at age of eighty-four (Fig. 9) 101
Painful heel, gonorrhœal (Fig. 10) 101
Painless exostoses on heel; venereal warts fifteen years before; no gonorrhœa (Fig. 11) 101
Fusion of all bones of wrist; infection twenty-five years before (Fig. 12) 100
Rheumatoid arthritis, a woman of sixty, showing a peri-articular chronic inflammation of twenty years' standing, with no joint involvement, in terminal joint of middle finger (Figs. 13 and 14) 101
Gout, man, age sixty-five (Fig. 15) 100
Sarcoma breaking through periosteum (Fig. 16) 101
Same, two months later (Fig. 17) 101
Sarcoma of lower epiphysis and end of left tibia—early in course (Fig. 18) .. 101
Carcinoma tibia (Fig. 19) 100
Anterior wall of chest, showing a small bulging about one inch to the right of sternum in the first interspace (Fig. 1) 104
Leuconychia totalis (Fig. 1) 108
Transverse grooves in the finger-nails from prolonged cold weather (Fig. 2) .. 108
Horticultural work at St. Elizabeth's Hospital (Fig. 1) 142
Patients at St. Elizabeth's Hospital working in (*A*) brush shop, (*B*) laundry (Fig. 2) 143
Truck farming within the enclosure for the criminal insane at St. Elizabeth's Hospital (Fig. 3) 148
Concrete construction work at St. Elizabeth's Hospital (Fig. 4) 148
A single layer of wide-meshed paraffined netting covering the burned area and a generous portion of the surrounding skin (Fig. 1) 174
Placing the gauze tampons, saturated with a 5 per cent. solution of dichloramine-T, in the incision, thus placing the germicide in contact with the infection and widely dilating the incision (Fig. 2) 175
The wound is covered with a light gauze dressing, two layers, which is changed whenever soiled (Fig. 3) 175
Photograph of the paraffin mosquito-net dressing (Fig. 4) 176
Approximating wound edges on tenth day by elastic bands (Fig. 5) 176

Digitized by Google

Results of four days' elastic pressure upon edges of wound (Fig. 6) 177
Photograph taken of right chest on the fourteenth day (Fig. 8) 180
Photograph of back taken on the fourteenth day (Fig. 9) 180
Canopy of blankets over bed, which is supported on four crutches (Fig. 10). 181
Photographs taken on the twenty-ninth day, fifteen days after photograph in Fig. 9 (Figs. 11 and 12) 180
Photograph taken on the seventeenth day, showing chest, abdomen, and axilla (Fig. 13) 181
Photograph taken on the twenty-fifth day, showing left axilla and chest four days after the scab had been removed and the surface had been treated with the net dressing (Fig. 14) 181
Photograph of the right axilla and chest taken on the twenty-fifth day; wound entirely healed (Fig. 15) 180
Photograph taken on the thirty-second day, showing the paraffined net dressing upon all the unhealed portions of the burned surfaces (Fig. 16) 180

Digitized by Google

Digitized by Google

Clinics

CLINICAL LECTURE

BY LOUIS FAUGERES BISHOP, A.M., M.D.

Clinical Professor of Heart and Circulatory Diseases, Fordham University School of Medicine, New York City; Physician to Lincoln Hospital

HISTORY TAKING IN HEART-DISEASE

GENTLEMEN: As a preface to our clinic this afternoon I wish to speak of history taking, because this topic is so exceedingly important in the investigation of heart-disease. It may happen, if you are practising in a small town, that you will have become gradually acquainted with your patients without any special effort on your part, but in a large city, where your patient comes out of "the nowhere" and appears before you as an absolutely unknown quantity, it is necessary to make a conscious effort along definite lines to become acquainted with him.

In investigating an individual who comes to consult you with reference to heart trouble, or for any other condition, it is a good plan to begin by letting the patient do most of the talking, letting him give out as much information as he will without direction. In this respect the average layman does much better than a physician when he becomes a patient. A layman will tell you a fairly straight story as to when he was taken ill, how long he has been ill, and how he feels. A physician (and it is my fortune as a specialist who devotes all his time to diseases of the heart to have many physicians as patients) very seldom tells a straight story about his symptoms. In the interests of truth it is better to allow a patient to tell his own story as far as you can before you influence his mind by questioning or suggestion. It is always important to avoid suggestion in history taking. The history taker has just as much to do with the nature

Digitized by Google

of the history as the person who gives it. In other words, histories are very much tinctured or colored by the person who writes them.

The average history that is taken of a sick person by a medical student is only of moderate value in the diagnosis of disease. The history is taken in hospitals and institutions generally by the least experienced member of the staff, and the treatment is administered by the most experienced. I would say that history taking is more difficult than the direction of average treatment. To take a good medical history requires a very good knowledge of medicine; it is a thing

Fig. 1.

_____ 191__

NAME _____

HOME ADDRESS _____ 'PHONE _____

BUSINESS ADDRESS _____ 'PHONE _____

REFERRED CONSULTATION DR. _____

FAM. PHYS. DR. _____

AGE S M W OCC _____

SYMPTOMS _____

that you will do very poorly at first, and you will have to strive to do it better and better as long as you study medicine.

I would add that history taking and the investigation of disease must become a matter of individuality. No two men ever pursue the same method, and the same method would not be likely to suit any two men. The method you use must grow up with you as your knowledge and training progress.

My own method in investigating heart-disease is, first, to ask the patient what particular thing is troubling him most; that I write in a conspicuous place on one side of my history blank. Then, by way of introducing the topic of family history, I ask the patient,

Digitized by Google

"Did your father live to a great age?" I then proceed to ask about the mother, brothers and sisters, and wife and children, and I often finish up by asking if there is any disease in the family. In this particular history blank I underline the points which I elicit by observation or questioning. The blank which I show you (Fig. 2) is one I adopted some years ago and I still continue to use it, because it suits my purpose. It is a blank designed for general practice. On this blank are printed a series of qualities, and you underline the one that applies to the individual under consideration. All the in-

FIG. 2.

FAMILY HISTORY _____

_____

_____

_____

DESCRIPTION AND HABITS _____

Short Tall Med.,____Ft.____in.; Stout Thin; Hab. Wght.____lbs.; Gained Lost ____lbs.; Blond Brunette Gray; Eyes: Blue Brown Hazel; Sleeps Well Poorly; Appetite Good Poor; Fullness Discom. Pain Chest Epigastrum Immediate____ Hrs. After Eating; Bowels Habit Occas. Constip. Loose Reg.; Urine at Night; Fam. Rel.____; Menses Not Reg.; Tobacco Hab. Occas. Mod. Excess; Coffee Tea Hab. Mod. Excess; Pulse Reg. Irreg. Usual Rate____Tension: High Low.

_____

PREVIOUS ILLNESS _____

_____

_____

_____

_____

formation recorded on this blank refers to the habitual condition of the patient and not to what he is suffering from at the present time.

All of this time I have kept the patient as far as possible from a discussion of his present condition. For the present history I use the following blank (Fig. 3), which is the same one that I use for daily visits thereafter. Every time I see the patient I fill out, as nearly as practicable, everything that is on the blank, except the data recorded on the first blank. This blank contains the important points in the daily condition of the cardiac patient. Most of this card is self-explanatory, but there are a few points of which I would like to speak. When you come to "Is eating," then "Protein" and

Digitized by Google

"Calories," you make an estimate in your mind whether or not the food ration is what it should be, and you check it as satisfactory or whatever in your judgment is defective. You then tell the patient what he should eat and what he should avoid, in the space on the blank provided for that purpose. You will observe that there is space for recording the psychological condition of the patient, the facies, general appearance, ophthalmoscopic findings, and the polygraph. When you come to the last line, "Wn. Rds. Alwd.," which means "Own remedies allowed," you very often find that the patient is taking his own remedies, to which there may be no objection; for instance, such remedies as bicarbonate of soda or castor oil. Then we have the diagram of the heart with the cardinal murmurs marked in, which I have adapted from Ewart's book. You cross out the murmurs that are *not* present: this is a much better method than to note the murmurs that you do hear, because if you note that a thing is absent, it is a permanent record of the fact that you have looked for it. Then in my own records I put circles around the arrows for the murmurs that do exist. In recording pain I generally make cross-lines on the diagram of the heart, and draw a line to the word "Pain," and then very often I draw a diagram of the back below. I have never seen this diagram of the back described anywhere, but I use it myself.

If the patient has a pain in his neck, I draw in lines to represent the occiput and then lines to indicate the pain. If the patient has a pain in the right side just behind, I mark on a rough sketch of the back.

This blank has grown up under my own use and I show it to you only as an illustration of a purely personal method of taking and recording histories. When I write a prescription, I mark the letter "℞" after "Take" in the history. I then turn the blank over on a piece of copying paper and write the prescription on the history slip. I keep the original and give the patient the copy.

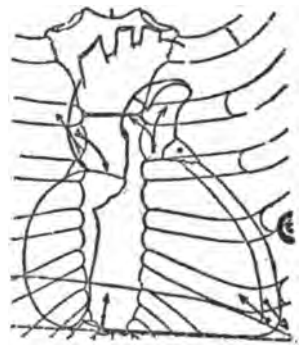
Some such methodical procedure is essential, for otherwise it is exceedingly difficult to grasp the main facts of a case of cardiovascular disease, and indications that may appear unimportant, but which are in reality of the greatest value, may be overlooked. What I have said applies to all general diseases, but it is particularly applicable to heart-disease.

Digitized by Google

FOUR HEART MURMURS IN ONE SUBJECT

CASE I.—Here we have a man, thirty-nine years of age, who gives no history pointing to a definite cause for his trouble. He was in the hospital once before for an attack of decompensation. One week before admission he suffered from gradually increasing shortness of breath, slight cough, and poor appetite, but he did not notice any œdema of the feet. His liver is tender and extends three or four inches below the margin of the ribs. He is probably, so

FIG. 3.



.....191....
AD.....TEL.....
PHYS.....FRND.....REL.....AGE
SYMPTMS.

BWLS.....SLP.....APP.....HDCHE.....
BTNG.....PLPN.....CGH.....PAIN.....
ADBP.....ASBP.....TSBP.....HRT.....
PLS.....TNG.....HGLBN.....OEDM.....WT.....
XRSC.....NDRNC.....URN.....LVR.....LNGS.....
IS TAKING
TAKE
IS EATING.....AL....TOB....CFF....
EAT AVOID
MNS.....PLGRP.....PSC. F.....APT.....FRDS.....
WN. RDS. ALD.....M.D.....XRY.....UND.....C. O....

far as I can tell, an example of cardiosclerosis of gradual development under some cause that is continually acting upon his heart.

On admission the apex of the heart was said to be displaced six inches from the median line. At the present time it seems to be about four inches from the median line. The first statement must have been an exaggeration. Over the aortic area I hear a systolic murmur. Now in the presence of a systolic murmur in a case of arteriosclerosis, if you make a diagnosis of aortic stenosis it will lead you into great error, for there is no actual obstruction to the onward flow of the blood. There is some hardening of the valves, but not enough to obstruct the blood current. Thus the relative enlargement of the aorta may cause a good deal of noise and almost uniformly

Digitized by Google

causes a systolic bruit. So remember that systolic murmurs in this class of patients are caused by relative as well as actual narrowing. The cardinal murmurs, as you may know, are caused by incompetence or leakage of a valve, by stenosis or obstruction of a valve, or by a combination of both conditions. Again, they may be caused, as I have just said, by a relative narrowing due to actual dilatation of a part beyond.

In the study of these murmurs the first step is to ascertain their time in the cardiac cycle, and this should be done with the hand on the impulse. The next thing to determine is the point of maximum intensity, and then the direction of the conduction of the murmur, the character, the duration, and their relation to the cardiac sounds. The point of maximum intensity in the direction of the conduction is of great assistance in differentiating the bruits that occupy the same position in the cardiac cycle.

This patient offers an excellent demonstration of the differences in the four systolic murmurs. The mitral systolic murmur, pointing to mitral regurgitation, has its area of maximum intensity in the region of the impulse, and can be traced into the left axilla. It is often heard over the back of the chest, and may be traced directly around from the axilla or heard there independently. The tricuspid systolic murmur is at its maximum intensity in the fourth and fifth intercostal spaces on the left side, close to the margin of the sternum. It is conducted toward the right, but is usually a soft murmur, with but a slight area of conduction. The aortic systolic murmur, pointing to aortic stenosis, is at its maximum intensity at the inner end of the second intercostal space on the right side, and it is conducted upward into the vessels of the neck. The pulmonary systolic bruit, pointing to pulmonary stenosis, has its point of maximum intensity in the third intercostal space on the left side. The presystolic murmurs are usually audible over a remarkably limited area.

These cardinal murmurs frequently occur together. It is, for example, unusual for mitral stenosis to exist as a pure lesion. In the process of thickening and contraction of this valve there is almost inevitably a degree of incompetence of the other valves. A to-and-fro murmur at the aortic cartilage which can be traced down the sternum is of frequent occurrence. In most cases it points to incompetence of the aortic valves. A to-and-fro murmur over the pul-

Digitized by Google

monary area which is not conducted to the aortic area is very rare. It points in some cases to patency of the ductus arteriosus, and there may be a loud systolic and diastolic murmur. I have met with that murmur only once or twice: the second time was in a house physician of one of our hospitals. I was called to see him because it was thought that he had developed malignant endocarditis. He was running a septic temperature, and there were a good many other indications that pointed to that condition besides this loud murmur. I was fortunate enough to make a diagnosis of a congenital murmur, and so was able to rule out the existence of an absolutely fatal condition, and the boy made a fairly good recovery. It is well to keep these rare murmurs in mind, since you never know when you are going to run across one of them.

To come back to our patient with the four murmurs, the only question of doubt here is whether you can really distinguish the presystolic murmur of mitral stenosis from the aortic murmur of incompetence, because they are both nearly simultaneous in time. I believe in this case that the presystolic sounds that we hear are not the same as the diastolic sound. This patient has these murmurs so distinct that I want you to take time to listen to them.

This patient is on digitalis, and he exhibits what is very common in cases of aortic regurgitation; that is, a loss of mental equilibrium, which seems to occur particularly under digitalis. This is explained on the theory that, the diastole being increased, the blood is drawn away from the brain.

CHRONIC ASTHMATIC CONDITION PROBABLY DUE TO FOOD POISONING

Case II.—This man is fifty-one years of age, born in Germany, a trained nurse by occupation, a graduate of Bellevue. He has been developing cardiac disease for a long time. His present attack began on October 22, with extreme shortness of breath, and since that time he has had repeated attacks of shortness of breath, particularly at night. During these attacks he coughs up a great deal of white fluid, but no blood. He has been treated in a number of hospitals, and usually has had the same treatment. He gets nitroglycerin, iodine, and belladonna. He is given a milk diet, with broths and coffee and tea. His urine, as you might expect from his appearance, is that of a man with more or less kidney trouble. He has albumin

Digitized by Google

and casts, though the specific gravity seems to be fairly high. His blood-pressure has been as high as 230 mm.; since he has been in the hospital this time it has been from 184 to 170, the latter about four days after admission. His heart shows no murmurs at the present time, but it shows a considerable degree of hypertrophy. His lungs show a great many sibilant and sonorous râles. His general appearance is that described best by the term "nephritic."

The old explanation of a case such as this would have been merely that the man had developed chronic nephritis and his alcoholic habit would be blamed for it. Now, personally, I believe that he is an example of chronic food poisoning, and I feel disposed to attribute his condition to chemical causes. The man had a voracious appetite and ate large quantities of protein food, the metabolism of which was interfered with by his alcoholic habit; in this way he set up a chronic auto-intoxication, to which I would attribute the damage to his blood-vessels and kidneys. I believe the injury to his blood-vessels and kidneys has been caused by the unfriendly proteins circulating in his blood.

As to his heart attacks, there are two possible explanations. We may explain them as a recurrence of the suffocating attacks of the terminal stages of arteriosclerosis. It is a frequent experience, which I have to meet every day of my life in private practice, to find people, particularly old people, who have had a high tension for a long time and hypertrophied heart, to develop attacks of suffocation coming on at night, during which they get œdema of the lungs and cough up a quantity of frothy mucus, and then they are treated and recover and they go on apparently as well as before. This condition is called *suffocative œdema of heart-disease.* I saw a man this morning who is recovering from a series of these attacks.

Another explanation is that this pulmonary condition is evidence of spasmodic asthma, and the reason he develops them is that he is anaphylactic or sensitive to some particular influence which, when it affects him, brings on these attacks of asthma. Asthma is one of the most peculiar of all diseases: you may have a patient who gets asthma if he eats a particular food or if he goes to a particular place, or it may come on while he is asleep or if he is nervous. Asthma comes on not only at the most astonishing times and under the most peculiar circumstances, but is often relieved by the most unusual

Digitized by Google

remedies. I believe that these asthmatic conditions are of very much the same nature as spasmodic asthma, but, being due to a different cause and arising in a different type of individual, they present different symptoms.

In this case I would say that the man's asthmatic condition was due to his auto-intoxication, and that his asthma would be relieved if we could relieve his auto-intoxication. We have attempted to do this by putting the patient on a "few protein" diet and by giving him castor oil. We have also given him digitalis to improve his general circulation.

I must say that I do not approve of putting high blood-pressure patients upon a fluid diet; it is absolutely contrary to the practice of many good men. We will put this patient on a dry diet and try to reduce the bulk of the body fluid rather than to increase it by giving him a fluid diet.

The relief of the bronchitis in patients of this kind is a matter in which the experience of the patient may be worth while taking into consideration. They have sometimes had a good deal of experience and their judgment as to what helps them is sometimes good. This man puts about a teaspoonful each of camphor, turpentine, and tincture of benzoin into a cup and then sets the cup in the mouth of a jug of boiling water, so that the steam comes up by the side of the cup and the heat vaporizes the mixture. He feels confident that when he inhales this it relieves his capillary bronchitis.

In my opinion, the best way to avoid these attacks is by clearing up the chronic auto-intoxication that underlies them. To this end I prescribe outdoor exercise, the elimination of all alcohol, which had a disturbing effect on his digestion and metabolism, the "few protein" diet, with the use of castor oil. That will put him in much better shape than he is now. I do not think that the iodide of potassium does much good in these patients, unless you find by experiment that a few grains make them feel better. Sometimes a grain or a grain and a half seems to make them feel better; the iodide, being excreted through the respiratory surfaces, makes the mucus easy to get up.

This man is really suffering from two conditions. He is suffering from arteriosclerosis and from what is known as chronic bronchitis—in other words, a chronic asthmatic condition.

Digitized by Google

FUNCTIONS OF THE HEART MUSCLE: DIGITALIS

A study of the functions of the heart muscle is of great practical value as applied to the actual care of heart patients. Diagnosis is very interesting, but in heart work it has been very much abused, in the sense that there has been too much diagnosis in proportion to the treatment. In fact, the heart work of the world, even at the present moment, is mostly in the hands of men who, if asked what their work was, would call themselves diagnosticians, and too often physicians are satisfied if they have made a fine diagnosis. Personally, I place no particular value on diagnosis except in so far as it may tend to help in the treatment of the patient and accrue to the prolongation of his life and the recovery of his health. The beauty of the modern school of cardiology that devotes much time to the disorders of the heart-beat is that it works out so well in treatment.

The fundamental functions of heart muscles, as I have told you, are stimulus production, excitability, conductivity, contractility, and the tonicity.

Case III.—We have here a patient upon whom I wish to make a practical application of what we mean by these functions. This patient affords an example of diminished tonicity of the heart muscle and blood-vessels. Primarily his trouble is not cardiac, but of the liver, and on account of the disease of the liver and alcoholism he has become an example of disorder of the heart-beat, showing particularly in the diminution of tonicity of the heart. This diminution of tonicity has led to a moderate degree of dilatation, and that has led to the development of the cardinal symptoms of cardiac disease. These cardinal symptoms you should never forget, because you apply them in everyday work when you decide the question whether the patient is suffering from heart-disease or not. I do not mean whether he *has* heart-disease or not; that is for the diagnostician. The question for the practical clinician is, "Is the patient *suffering* from cardiac disease?"

The answer to this question is founded on the fundamental symptoms of heart-disease, and these are founded upon the failure of the circulation, because, if the person is suffering from heart-disease, there is a failure of the primary business of the heart—that is, circulating the blood. That shows itself in three different ways: In the

Digitized by Google

first place, shortness of breath. Our patient here tells me that he has developed great shortness of breath. In the second place, heart-disease shows itself in congestion of the liver, because, when the heart is dilated and does not perform its function properly, the blood is collected in the great blood-containing organ, the liver. This man also complains of swelling of the feet. You never find a person suffering from acute failure of the heart without these three symptoms—shortness of breath, swelling and tenderness over the liver, and swelling of the feet. If a person can climb stairs without losing his breath, if he never has any œdema of the feet or legs and no swelling of the liver, that person is not suffering from heart-disease at that time. He may have heart-disease without suffering from it; that is he may have damaged valves or there may be a number of other things wrong with the heart, but unless he develops the cardinal symptoms of heart-disease, it is not heart-disease that is causing his suffering. This patient shows these symptoms because of weakness of the heart superinduced by alcoholism.

The treatment of diminished tonicity of the heart muscle represents one of the few specific measures that we have in medicine; namely, the use of *digitalis*. Just as it is most difficult to learn to use mercury or quinine for its specific purpose, so it is very difficult indeed to learn to use digitalis. I am not exaggerating when I say that not one physician out of twenty knows how to use digitalis properly, because there is a great misapprehension as to the properties of the drug.

A committee appointed a few years ago by the Section of Therapeutics of the International Medical Congress to study and report on "Cardiac Remedies," rendered the decision that the other remedies of the digitalis group, squill, strophanthus, and convallaria, were so far inferior to digitalis that there was no justification for their use. They even made but slight mention of nitroglycerin. Now that is in accordance with my practice for quite a number of years. To get results a doctor must be taught how to use digitalis, and it must be explained to him in a way that he can understand and carry out. Such an explanation I am going to attempt to give you.

Now I believe that the heart-beat is essentially a chemical phenomenon just as running an automobile with gasoline is a chemical phenomenon. An automobile has valves and is constructed on me-

Digitized by Google

chanical principles, but its action is nevertheless essentially a chemical phenomenon, because it runs by the combination of gasoline and oxygen. In the same way the heart-beat is essentially a chemical phenomenon, and the action of digitalis on the heart is due to its power of modifying the chemistry of the heart.

Suppose you have a patient who has a dilated heart; this man may recover simply by rest in bed and does not need any digitalis. If, however, his heart was much dilated and his feet were very much swollen, you would have to use digitalis. Let us suppose the man has not had any digitalis and we give him some this afternoon; nothing would happen the second or the third day, perhaps nothing would happen on the fourth or fifth day, but the sixth or seventh day the man would show the effect of the digitalis. He would then either vomit, or his heart would become slow, or he would have a diarrhœa; from that time on he would show the digitalis effect from even a small amount.

My mental picture is this: The digitalis acts in a chemical way on the tissue of the heart very much as alkali acts on an acid mixture when you drop it in a little at a time. If you place some litmus paper or other indicator in the test-tube and drop in the alkali solution, all of a sudden the mixture changes to blue, and then you know that you have your solution saturated. Now suppose some force was acting that had a tendency to change that solution back to acid; you would have to keep adding a little of the alkali right along to keep the reaction as it was, but if you added more alkali than is being destroyed, you would reverse the process and get a very caustic mixture. Now do not understand that the chemical action of the digitalis on the heart is acid or alkaline, but keep that illustration in mind to help you remember that in some way the digitalis modifies the chemistry of the heart-beat after a sufficient time has elapsed. You see, this action has both a quantity element and a time element. For that reason digitalis is of no use as an emergency drug where you have not time to wait for the effect. But when you do get the effect, then all of a sudden the chemistry of the heart is altered, and anything added over what is used up is unnecessary and harmful. Consequently the way to use digitalis is to give as much as is reasonable at first until the reaction of the heart occurs. Then stop the

Digitized by Google

digitalis and give only as much as you believe is eliminated. If you go on with the original dosage you kill your patient.

There is another point with reference to the time element in the reaction. You may get the digitalis effect in four days or you may get it in six days, but the usual time is five days, provided you started with a digitalis-free patient. But we do not get an opportunity more than once or twice a year to test this digitalis effect on serious cases of heart-disease, because they all get digitalis before they come to the hospital. A woman whom we started on digitalis last week showed the effect on the third day, but upon inquiry I found that she had been given digitalis before and her heart was not digitalis-free. This made it possible for her to develop the symptoms of digitalization on the third day. If a patient has had strophanthus, convallaria, squill, or any of the digitalis group, or any of the digitalis principles, you must discount that in giving the dose; if you give full doses you get the reaction very quickly. A great many persons are killed every year by being transferred from one man's care to another's, and receiving an overdose of digitalis on top of digitalization. There is no great danger in the first digitalis reaction, no matter how violent it may be, since the nausea is so profound that you can not make the patient take any more of the drug.

There is another important point about the nausea of digitalis, and that is, that it can not happen under three or four days in a digitalis-free patient. I do not know how many times it has happened that I have been called to see a patient in the terminal stages of heart-disease with dropsy, swollen feet and legs, and congested liver, and have been told that the patient was absolutely unable to take digitalis because it was vomited. Now the nausea of digitalis does not come until the patient is digitalized. You can not ordinarily produce nausea in a digitalis-free patient with less than six or eight ounces of infusion of digitalis. So it is my practice nowadays in these patients to absolutely ignore the belief of the doctor that the nausea comes from the digitalis, and to enforce the digitalis in spite of everything, because these are desperate cases and you have to do something for them. A great many times I have seen the nausea disappear after the administration of digitalis because of the improved circulation. The nausea of digitalis is not a stomach nausea; it is exactly analogous to sea-sickness. It is of central nervous origin and can be

Digitized by Google

produced by the intravenous injection of digitalis. The nausea of sea-sickness is of cerebral origin, probably the effect of the balancing mechanism of the ear, which is constantly irritated by the instability of the body. Digitalis produces this nausea through the nerves of the stomach, and, as I have said, the nausea of a very sick heart patient is oftentimes relieved when the circulation is improved.

There is one condition in which digitalis is of more use than in any other, and that is in fibrillation of the auricle. When the auricle is sending out a great number of impulses, the ventricle can not respond, and then the benefit derived from digitalis is due not only to an improvement of tonicity but to blocking of the impulses. I wish to show you a polygraph of a patient who came to me a year and a half ago with a pulse of 160 or more and perfectly regular. I believed she was suffering from auricular flutter, and, such being the case, the only thing to do was to keep her thoroughly digitalized, which I have done. The last time before she came to me she made a mistake and took more digitalis than I ordered, so the digitalis heart-block here is very striking. There is no doubt but that her auricular flutter has been converted into a fibrillation. That is the result of digitalis in these cases, and it seems to be unavoidable. This has been pointed out by Lewis, of London. It is to be expected that a very rapid and regular pulse will be converted into a slow and irregular pulse.

The observation of a great number of these patients has led me to the conclusion that 90 is about the best pulse-rate to maintain. When they start with a pulse-rate of 160 or more, if you can reduce it to 90 they go along with very few symptoms and do very well. This woman is able to do almost anything within reason, but she is absolutely dependent upon digitalis; if she were deprived of it she would probably develop dilatation.

Now I wish to take you into the ward and take a tracing of a woman who has had a very rapid pulse. She had digitalis for two days, and then she vomited and has not had any since; so I am not at all sure that I shall find the true digitalis effect. (Tracing taken.) You see, the tracing is not unlike the one I showed you before. There is nothing to be made out of the jugular curve. You will never see a better example of the effect of digitalis than in this patient, whom we examined last week before she had the digitalis. You will never

Digitized by Google

see a better example of digitalis producing a beneficial heart-block than in this patient.

An interesting point suggests itself here in diagnosis. If this patient had been suffering from Graves's disease (exophthalmic goitre), instead of paralysis of the auricle, our digitalis would have had no such effect. It is a well-known experience that in Graves's disease digitalis does not act to slow the pulse in any such manner as this. In Graves's disease there is a functional hyperactivity of the heart without any defect in structure, and we are not able to slow the heart. We can slow the heart only when the auricular ventricular rhythm itself is normal, and when the ventricle is acting too quickly only because of the great number of impulses it gets from the auricle. In Graves's disease there is no trouble with the auricle and the hyperactivity pertains to the whole heart, but when the rapidity is due to the great number of impulses coming from the auricle, and when you place an artificial heart-block between the auricle and the ventricle you get this typical effect. We have an artificially diminished conductivity, because we have blocked out a certain number of impulses.

You see, modern cardiology is very different from the old teaching. When I was a student we would have spent a long time analyzing the different murmurs and have proved to ourselves that this patient had mitral stenosis and regurgitation and aortic stenosis, and so on. We pass these things over lightly now because we believe the heart muscle is the essential basis of the mechanism and we will have to put up with the valves as we find them. It is not worth while spending time in the diagnosis of things we can not modify. I do not mean that we should pass over these cases without knowing what structures of the heart are involved, but it is better for the patient's welfare to study the functions of the heart.

Digitized by Google

A CLINIC FOR THE TREATMENT OF NON-PULMONARY TUBERCULOSIS IN OUT-PATIENT AND DISPENSARY PRACTICE

BY JOHN B. HAWES, 2d, M.D.

Director, Department of Non-Pulmonary Tuberculosis, Massachusetts General Hospital; Secretary, Board of Trustees, Massachusetts Hospitals for Consumptives; Instructor in Medicine, Harvard Medical School
Boston

THIS clinic, held once a week at the Out-patient Department of the Massachusetts General Hospital, is devoted to the care and treatment of patients with some form of non-pulmonary tuberculosis. Patients with pulmonary tuberculosis are not admitted. Strictly orthopædic cases are treated elsewhere. The majority of my patients have tuberculosis of the glands of the neck or some form of genito-urinary tuberculosis; in addition, there are a few with tuberculous dactylitis, synovitis, tuberculous sinuses, lupus, ocular tuberculosis, mesenteric gland tuberculosis, and other forms. Rather contrary to the rules of the hospital, men, women and children are here grouped together. As a result, they come to know each other well and to know their physician intimately. I do not know of any other hospital in this country where patients with non-pulmonary tuberculosis are handled in this way. The official title is the "Clinic for the Treatment of Non-Pulmonary Tuberculosis." Some call it a "Tuberculin Clinic," a name to which I strongly object.

The term "surgical tuberculosis" is often applied to such a group of cases. This term I believe to be a complete misnomer, and the sooner it is entirely dropped from our nomenclature the better. Fifteen, or as recently as ten years ago, in this hospital and much more recently elsewhere, there was a curious distinction made between patients with pulmonary tuberculosis, or consumption, and those with tuberculosis elsewhere in the body. The man with tuberculosis, if he is fortunate enough to have it in his lungs—and I use the word "fortunate" advisedly—is immediately sent to a sanatorium, or in some other way given the fresh air, sunshine, food, rest, and proper hygiene of

Digitized by Google

which he is so urgently in need. His less fortunate brother with no evidence of tuberculosis in the lungs, but with the disease caused by identically the same organism in the glands of the neck, kidneys, or elsewhere, is far too often treated as a "case" and as a proper subject for the surgeon's skill, or rather the lack of it. In one group the patient is treated as a human being who happens to have tuberculosis in his lungs; in the other group the patient himself is not treated, but the surgeon devotes his efforts more or less unavailingly to a tuberculous gland or to some other tuberculous focus in the body. I have never been able to understand this, but the fact remains that this distinction between pulmonary and non-pulmonary tuberculosis is still made all over the country. I do not mean for a minute that surgery is not an important factor in treating this group of patients. I do mean, however, that in by far the greater majority of instances an operation is an incident, great or small as the case may be, in a course of treatment, the most important part of which comes *before* and *after* the operation. The sooner this fact is recognized the better will be the results. Therefore I try to make it clearly understood, both to patients and physicians, that in this clinic I am not treating glands in the neck or genito-urinary tuberculosis; I am treating human beings, men, women, and children, who happen to have tuberculosis somewhere in their bodies. I regard this personal and human relationship between physician and patient as absolutely essential to success.

This department is modelled after the Emanuel Church Tuberculosis Class for Consumptives as originated and formed in 1904 by Dr. Joseph Pratt, of this city. I was associated with Doctor Pratt in this class, and later formed one of my own. In Massachusetts, as the number of beds for consumptives in hospitals and sanatoria has increased, the need of tuberculosis classes for patients with pulmonary tuberculosis has to a large extent ceased to exist. On the other hand, at this hospital and at others in the city there were large numbers of patients not fortunate enough to have their disease localized in their lungs who came back and forth to the various surgical out-patient departments where operations large and small were performed, sinuses washed out, new bandages and dressings applied, but where the patients themselves were not receiving what I call adequate or rational treatment. It was to this group that I decided

Digitized by Google

to give my attention, resulting in the formation of this clinic. At first it received but scant recognition from the hospital authorities and little or no coöperation from the surgical staff. Gradually, however, the surgeons have come to realize that I am not trying to deprive them of their patients, but that I am merely trying to do away with unnecessary surgery and to make infinitely more effective what surgery is necessary.

The clinic is held once a week, with an average attendance of between forty and fifty patients; it should be held twice a week, but I have not the necessary time nor energy to do this. Dr. P. Challis Bartlett assists me, a social worker keeps charge of the records and makes home investigations when necessary, and the hospital provides me with a nurse, who unfortunately is changed every six weeks, and the necessary equipment. Doctor Bartlett and I prepare and administer the tuberculin. The clinic commences at 9 A.M. and continues until each person is seen and interviewed personally by either Doctor Bartlett or myself. Each patient, on admission, is given a card with the number in which he or she appears. They sit down together, soon come to know each other intimately, and seem to regard this weekly meeting as rather a social event. The temperature, pulse, and weight are taken by the nurse and recorded. Doctor Bartlett and I then go over with each patient the details of the past week, particularly with regard to the effect of tuberculin. If everything is going well, the interview is a short one; if not, we go into further detail and give advice and instruction for the future. We mix our own tuberculin, which is provided through the kindness of the Saranac Laboratory, and administer it ourselves. When necessary the patients are sent to the Surgical Department and to the Genito-Urinary Department for local treatment, dressings, etc., and in every instance the lungs are carefully and, if necessary, repeatedly examined. At first there was little or no coöperation between the various surgical departments and my own. At the present time, however, we have developed a spirit of very close coöperation, so that consultations are frequently held in regard to problems which come up from time to time.

It has been interesting for me to note the change in the attitude of the surgeons toward operative procedures. At first, as is the case elsewhere, they were very eager to do the so-called " radical dissection

Digitized by Google

for glands of the neck." At the present time, however, this attitude is entirely changed, and it is only rarely that a patient is sent into the hospital for an extensive removal of the glands. Indeed, sometimes I find it difficult to get a patient operated on when I really believe that this should be done. The surgeon is very apt to advise further treatment in my clinic. I think I can safely state that operative procedures for tuberculous adenitis have diminished tremendously during the past ten years at the Massachusetts General Hospital. The number of patients whom I now see with the scar of an extensive operation in the neck is small, while there is an increasing number who show small and hardly noticeable scars, the result of more conservative surgery.

TUBERCULIN

My attitude in regard to tuberculin is, first and foremost, to see that it does no harm. In a certain number of cases it undoubtedly does good, and in genito-urinary cases a great deal of good. I use bouillon filtrate chiefly, because this is the kind of tuberculin provided me from the Saranac Laboratory. I can see no reason for changing it. We use it very conservatively, commencing with 0.0001 mg. or even 0.00001 mg. and increasing very slowly. The highest dose I have given is 400 milligrammes. Reactions are very rare. Occasionally, in cases of renal tuberculosis, I have deliberately given a larger dose than usual in order to bring about a reaction. This, in my experience, does good in certain cases which seem to have reached a stationary condition. In patients with cervical adenitis the value of tuberculin depends upon the individual case. Those patients who are evidently suffering more from the toxæmia of tuberculosis rather than from lumps in the neck, who are under weight, poorly nourished, and in generally poor condition, do not improve much with tuberculin alone. General hygienic measures are far more important in such instances. On the other hand, men, women, and children who are apparently strong and healthy, who need no extra weight, who have proper hygiene and good food, where the source of infection, such as tonsils or teeth, has been removed, and in whom, in spite of all this, the tuberculous process still continues—this type of patient is the one in which tuberculin seems to do wonders. In addition, the administration of tuberculin undoubt-

Digitized by Google

edly has a psychological effect. The mere fact that the patient comes in regularly once a week and suffers a certain amount of pain, naturally very slight, by having a needle put into his or her arm, and who is told that this procedure is going to do good, is undoubtedly helped by having this done. There are certain patients to whom I could give injections of sterile water and accomplish nearly as much good as I can by means of the tuberculin. Such cases are rare, however; it is far safer to regard tuberculin as a powerful agent either for good or for harm. I do not feel that general practitioners should use tuberculin, and I also believe, as stated above, that one's first and foremost object in its use should be not to do any harm.

HELIOTHERAPY

I have tried to instruct all these patients in the value of heliotherapy. Naturally, in such a large clinic as this, where we can not go into the homes of each one and find out the exact conditions in every detail, sunlight treatment can not be carried on very successfully. Our greatest difficulty, of course, is the fact that our New England climate offers very little opportunity for prolonged heliotherapy. In a few instances, particularly in the cases of children with cervical adenitis, I have been able, with the help of my social worker, to institute heliotherapy during the summer months with excellent results. To carry this on successfully, institutional treatment is almost a necessity.

FOCI OF INFECTION

In every case of cervical adenitis there is a detailed examination of the nose, throat, and teeth. In a great majority of cases it is the tonsils rather than the teeth that are at fault. The attitude of the physicians in the nose and throat department has been to recommend tonsillectomy even in cases in which there was no manifest disease of the tonsils. I quite agree with this attitude in this class of cases, so that if a patient has been under treatment for two months or so without showing manifest improvement, and especially if the glands in the neck have existed for some time prior to coming to the clinic, I recommend that the tonsils be removed. In regard to the teeth I am more conservative, particularly in adults. I do not feel sure that the X-ray evidence justifies radical removal of the permanent teeth except in rare instances.

Digitized by Google

PERSONAL RELATIONSHIP BETWEEN PHYSICIAN AND PATIENT

The most important factor in making this clinic a success is the strong personal relationship which exists between the physician and the patient. The majority of these patients I come to know intimately, and many I call by their first names. The force of example is a strong factor in helping those who are beginning treatment. A child of five or ten years coming for the first time is apt to be terrified by the examination and by the administration of tuberculin, or else sulky or rebellious; on later visits, however, seeing other children undergoing the same treatment without minding it, such a patient causes little or no trouble. In the great majority of instances we have little or no difficulty in obtaining coöperation from the children, and particularly from the mothers; nevertheless, if after a fair trial the patient, either through ignorance, carelessness, or laziness, is unwilling to carry out treatment as I direct, he is discharged from the clinic and, except in rare cases, refused readmission. I have had to resort to this very seldom.

RESULTS

It is difficult to demonstrate in tabular form or on a printed page the good results or otherwise from a clinic of this kind. If it were possible for me to have a photograph of each patient on admission and another on discharge, I could show a large series in whom the results, to me at least, have been strikingly good. Dowd and Matthews, of New York, and Ladd, of Boston, have reported remarkably good results with children under their care who have been operated on for tuberculous cervical adenitis. Some of Doctor Ladd's patients I have seen personally, and I have admired the beautiful scars left from his operations. Surgery in the hands of such men as these certainly shortens treatment to a great extent as compared with the time it takes me with tuberculin, general hygienic measures, and conservative surgery. On the other hand, the time of most of my patients is not worth very much, and I believe that I can show as large a number of patients with cervical adenitis, who have either had no operation at all or in whom the operation has consisted of a slight incision to open a softened gland, who are now well and strong, as can Dowd, Matthews, Ladd, or indeed any other surgeon. Were the surgery of tuberculous cervical adenitis limited to a few men

Digitized by Google

in this country, many of whom I could mention, who from long experience and special skill are eminently qualified to do work of the highest type, I would have little to criticise in the surgical treatment of this disease. This, however, is not the case. There are hundreds of surgeons and hundreds of general practitioners who are doing more or less surgery who may not feel qualified to do difficult abdominal operations, but who do feel that they are eminently qualified to operate on glands in the neck; in these cases the surgeon's attention is far too apt to be focused on the lump in the neck rather than on the child who has the lump. The results, at least in Massachusetts, have not been good.

ILLUSTRATIVE CASES

(1) C. G. A.—This man, an engineering draftsman of thirty-three, came to the hospital, June, 1917, with a diagnosis of *tuberculous adenitis.* He weighed 151 pounds. His general condition was poor. After seeing him a few times I advised him to go off into the country for the summer and to report to me in the fall. He returned to the clinic in September vastly improved, except as regards the glands, which remained about the same size. Under tuberculin these have decreased greatly. It has been necessary to incise one gland, which is now draining but rapidly clearing up. His weight has increased from 151 to 162 pounds.

This is a case in which the treatment by general hygienic measures of the patient himself was of distinctly more importance than local treatment of the glands. I doubt if tuberculin would have done him any good if I had given it to him in the condition in which he was last June. It proved of marked benefit, however, after his general condition had improved.

(2) E. J. A.—This woman of thirty-four was operated upon July, 1917, for *tuberculosis of the uterus and appendages.* She has attended the clinic from August 15 up to the present and has gained steadily in every way. She will continue under treatment for a long time to come.

In this case and in similar ones a surgical operation was an important factor in removing the greater part of the tuberculous focus. It is practically impossible to remove all the diseased tissue, however, which makes it extremely important to continue treatment and

Digitized by Google

to keep the patient under supervision for a long time after the operation.

(3) R. A.—This patient was a little girl of thirteen with a large mass of *tuberculous glands.* She has attended the clinic regularly since March, 1917. She has gained over ten pounds in weight. Her general condition has markedly improved and the glands have practically disappeared. I advised the removal of one or two of the larger glands, which was done by the simple operation and small incision.

This is the type of case in which ten years ago at this hospital, at least, the so-called radical operation for glands in the neck would have been done. Perhaps the results would have been good. By the removal of the tonsils, care of the teeth, and general hygiene, an excellent result has been obtained with the very simplest of surgical measures.

(4) A. H.—This woman, thirty-two years old, came to the clinic October, 1917, with a diagnosis of renal tuberculosis. The right kidney had been removed at a previous operation a few weeks before, and the remaining kidney was found to be tuberculous. She has attended the clinic steadily since that time—at first once a week, now once every two or three weeks. She receives large doses of tuberculin, on which she has come to depend for relief of symptoms. She still has attacks of frequency of urination, with considerable pain and some blood in the urine. Her general condition is excellent. She is able to do her own work, and she has had one healthy baby during this period. She has gained 20 pounds in weight.

This is a type of case in which tuberculin and constant supervision, in my opinion, are solely responsible for the prolongation of the patient's life. Granted that the cure of bilateral renal tuberculosis almost never takes place, the fact that this patient is still alive and is able to lead a useful life five years after her operation shows that such cases under proper treatment do not always progress rapidly to a fatal determination. Very likely this will happen eventually, but I see no reason to believe that it will be in the near future.

(5) S. M.—This woman, an Armenian, thirty years old, came to the clinic April, 1917, with the most extensive *tuberculous disease of the cervical glands* that I have ever seen. There were many ugly scars, two to three inches long, of at least six or seven previous

Digitized by Google

"radical" operations, with the recurrence that so often takes place. Pus was oozing from many sinuses. Her general condition was poor in the extreme. I told her and the physicians in the surgical department whence she was referred to me that I would not think of treating her in my clinic in her present condition. Through our social service department she was sent away for the summer with detailed directions from me as to how to live. Before sending her away, however, tonsils and adenoids were removed and the teeth thoroughly cleaned. She returned in September vastly improved. Since then she has attended the clinics regularly and has continued to improve in every way. The sinuses are entirely healed, the swelling has subsided, and the scars are now healthy and clean. Her weight has gone up from 129 to 145 pounds.

This patient, before coming to my clinic, was a striking example of the surgical treatment of lumps in the neck and of the utter lack of treatment of the individual owning the lumps. Treatment given to the patient, according to common-sense and rational methods, even when dealing with a low-grade intelligence and excessive poverty, has brought about a striking improvement.

(6) J. P.—An Italian girl of seventeen entered the clinic October, 1915. The glands were extensively enlarged up to one or two inches in diameter in both sides of the neck. Her general condition was poor. Tonsils and adenoids were removed. Under treatment she gained in weight from 117 to 130 pounds. The glands subsided until only one or two of the largest ones remained. These larger ones I have had removed with a very small incision. Her general condition is now excellent in every way.

(7) L. B. R.—This boy, aged four years, was brought to the clinic in August, 1915, weighing 32 pounds. There was a mass of glands as big as a large orange extending from the left ear and angle of the jaw to the clavicle. He was weak, frail, and anæmic. Tonsils and adenoids were removed at once. Under outdoor treatment, heliotherapy, good hygiene, and tuberculin these glands have literally melted away, while the boy himself has improved wonderfully. One small gland softened down, requiring a half-inch incision. The boy is entirely well now and reports to the clinic once a month for observation.

This is a striking example of what patience and perseverance

Digitized by Google

can do. To have attempted a radical operation in this case would have been a most serious procedure, with a very grave risk not only of recurrence but of life itself. It has taken a long time to bring about this satisfactory result. The mother has brought the boy in from a town forty or fifty miles away from Boston every week as often as I asked her to do so. The boy's time, however, is worth little or nothing, and the mother has gladly given her time and energy to save her child from an extensive operation that has now proved quite unnecessary.

(8) R. J. D.—This man, aged eighteen, entered the clinic September, 1916. He was strong, healthy, and robust, good color, and the picture of health, except for an immense mass of glands occupying the entire left side of his neck from the jaw to the clavicle. He weighed 162 pounds and was somewhat overweight. Tonsils and adenoids were removed shortly before entering the clinic. These glands have decreased markedly in size, so that instead of one large rounded mass there are now only two or three glands about one inch in diameter. One of these broke down and had to be opened, leaving a small scar. His weight has gone down to 155 pounds, which is much better for him. His general condition is now excellent. He comes to the clinic every three weeks.

This is another case in which an attempt to remove this large mass of glands by radical surgery would have been difficult and dangerous. I have given this patient, however, and others their own choice in the matter as to whether or not they prefer to enter the hospital to have the radical operation performed. He has declined to do this, and I believe he acted wisely in so doing.

(9) R. C.—This Italian girl of ten entered the clinic April, 1917, weighing 71 pounds. Tonsils and adenoids were removed. There were numerous glands on each side of the neck, under the chin, and in the axillæ. General condition was very poor. She has improved in every way—sinuses have closed, glands have decreased in size, and she has gained 10 pounds in weight. She still attends the clinic regularly.

The glands in this case were so scattered that any attempt to remove them by surgery would result in numerous unsightly scars. She has improved rapidly at present, and I believe will get entirely well without operation of any sort.

Digitized by Google

(10) M. H.—This patient, a school teacher, twenty-five years of age, had *bilateral renal tuberculosis,* with one kidney removed prior to entering the clinic in March, 1917. She came regularly and now has reached a dose of 400 milligrammes of tuberculin without reaction of any kind. Her condition varies greatly. At times the frequency of urination is marked—fifteen to twenty times during the night, with much pain and blood. At other times it is diminished. She appears to be a picture of health, and is now working as a clinic manager in the hospital.

It seems to me that this is a case where tuberculin is directly responsible for saving this patient's life. Prognosis of bilateral renal tuberculosis is considered absolutely bad. The fact that this patient, three or four years after her condition was diagnosed and one kidney had been removed, is able to work regularly and to earn her living is forcing us to change our views on the subject and is making of me, at least, an optimist rather than a pessimist, so far as renal tuberculosis is concerned.

I have nearly 600 cases on my records—over 400 of cervical adenitis and 125 of genito-urinary tuberculosis. It is slow and at times discouraging work. The changes brought about from week to week are slight, but on asking the majority of my patients concerning their condition at present compared to what it was six months ago, I nearly always get the same reply—that they are greatly improved. This certainly confirms my own opinion. I have tried to be sane in my attitude in the treatment of non-pulmonary tuberculosis and have endeavored not to overestimate or underestimate the importance of any one part of this treatment—surgery, tuberculin, hygiene, etc.—but to give each due credit. I believe strongly that there has been, and still is, too much surgery in these conditions, and I believe still more strongly that to get the best results we must treat the patient and not merely the tuberculous focus in his body.

Digitized by Google

GYNÆCOLOGIC CLINIC

LONG ISLAND COLLEGE HOSPITAL, OCTOBER 25, 1917

BY DR. JOHN OSBORN POLAK

HYSTERECTOMY FOLLOWING REPAIR OF THE PELVIC FLOOR

THIS woman, a Russian, forty-six years of age, was admitted to the Long Island College Hospital on October 23, 1917. Her family history is negative.

Personal History.—She has been married twenty-five years and has had five children, the youngest three years of age. The first three were delivered with instruments. The puerperia were normal, the patient being in bed ten days. She had one miscarriage at three months; she was not curetted.

Menstrual History.—Menstruation had been regular until the last few months, during which time there had been continuous spotting, but no regular menstruation. Douching or coitus provoked a bloody discharge.

Physical Examination.—The patient is stout and short-coupled. The heart sounds are normal. The abdomen is moderately fat, lax, and moderately pendulous. The pelvic floor is torn, the tear extending through the pubococcygeal bundles of the levator on both sides. There is a marked rectocele on straining. Examination of the cervix reveals a glandular cervicitis, with multiple lacerations and marked ectropion. A mucous polyp protrudes from the cervical canal. The uterus is enlarged to almost the size of an eight-weeks pregnancy, but it does not show the characteristic signs of pregnancy. There is no softening of the cervix, no compressibility of the isthmus, and no asymmetry of contour. Instead of being flattened anteroposteriorly and widened from side to side, the uterus is pyriform in shape. This condition of the cervix we consider precancerous because of the excessive glandular development and the extreme friability of the cervical structures. The procedure in such cases of cervicitis in a woman who is forty-six years of age is to remove the uterus. This is done because the most generally admitted cause of cancer is continued chronic irritation and chronic

Digitized by Google

inflammation. The defensive reaction to any irritation that falls short of cell destruction is an active karyokinesis. The more active this becomes the more nearly the cells approach the embryonal type. The more the normal process of healing is interfered with by a continuance of the irritation, the more irregular is the mitosis of the cells. Irritation enormously increases the reproductive power of the cells, and the young cells grow and disseminate without guidance. So in the cervix with marked glandular hypertrophy and ectropion, as the irritation continues, the young cells, instead of being able to arrange themselves properly, take an irregular arrangement and thus take the first step in cancer formation—namely, cells out of place or in a non-orderly arrangement; continued repetition of this gives rise to more new cell formation in attempts at defence, and we get a still greater cell disarrangement.

In this patient the function of the kidneys is deficient. The phenolsulphonephthalein test shows an output of only 12 the first hour and 9 the second, which is decidedly lower than normal. Notwithstanding this, the quantity of urine passed is sufficient, and the microscopical and chemical examinations show neither albumin, sugar, nor casts. Hence we must conclude that the functional deficiency is cardiac. This conclusion is borne out by the blood-pressure, which is only 130 mm.—too low for a woman of this age.

In preparing the vagina for a hysterectomy, even though the hysterectomy is to be done by the abdominal route, it is important that the vagina be clean, particularly if the operation is to be a complete one. This sterilization is accomplished by thoroughly iodizing the mucosa with a 3½ per cent. iodine solution; this is allowed to dry and the vagina then firmly packed with iodoform gauze. Further security against infection may be had by firmly packing the interior of the uterus with iodine-soaked gauze. We can then freely open the vagina from above with safety. We feel that whenever the condition of the patient justifies it the hysterectomy should include extirpation of the entire cervix; this we do as a routine procedure except in a few myomata in young unmarried women. The reason for this radical course is because a certain proportion of these cervices subsequently become the seat of a malignant degeneration, and, secondly, because of the frequency of a persistent

Digitized by Google

leucorrhœal discharge, which is one of the unpleasant sequelæ following hysterectomy with retained cervix.

Operation.—The patient is placed in the extreme Trendelenburg position. The advantages of this position are, however, sometimes counterbalanced by certain disadvantages to the patient. While it permits the surgeon to operate with greater facility, to use fewer laparotomy sponges, and to expose the operative field, it definitely embarrasses the patient's respiratory apparatus, and the blood-pressure is changed by this posture; so that it is advisable not to continue the patient in this position any length of time, especially if the maintenance of this posture produces cyanosis.

With the patient in the Trendelenburg position we will now open the abdomen. We usually make the incision just to the side of the median line, either to the left or the right, in order that the rectus muscle may be pushed off from its median attachment without disturbance of its blood or nerve supply. After making the incision to the right or left of the median line the rectus muscle must always be displaced outward and not inward, as the blood and nerve supplies come in from the outer side.

After the peritoneum is opened the muscle, fat, and the wound surfaces are protected with sterile towels and so saved from the bruising and soiling incident to retraction. After the abdomen is open and before any intra-abdominal procedure is undertaken, it is a good plan to explore the appendix, the gall-bladder, and biliary ducts and to make a general survey of the abdomen and its contents. In this case the gall-bladder and ducts are negative.

We will now proceed to remove the uterus. As this woman is forty-six years of age, there is no advantage in retaining the ovaries. We place a ligature distal to the outer side of the ovary, ligating the infundibulopelvic ligament, and tie the round ligament; in this way we have controlled the blood supply in the ovaries and round ligaments. We now proceed to separate the two sheets of the broad ligament and the bladder from the front of the uterus in the routine way, a procedure which becomes easier as one becomes technically more expert. If one does this as a routine procedure in every hysterectomy, the training thus obtained will be invaluable where it is necessary, as in malignant disease, to expose the ureters and ligate the uterines external to the ureters. After we have freed the sig-

Digitized by Google

moid from its adhesions to the left infundibulopelvic ligament and the uterus, we proceed in a similar manner on the left side. Having ligated and cut away both of the round ligaments, we slip the scissors across the front of the uterus underneath the vesical reflexion of the peritoneum. In the median line we find a very firm attachment, which is sometimes described as Goffe's ligament. When this is cut, the bladder may be pushed off the entire anterior surface of the uterus and the upper portion of the vagina. Now, carrying the uterus to one side, we go down between the folds of the broad ligament which we have separated and isolated the uterine artery and clamp it, and so control the uterine bleeding. Unless both uterine arteries are controlled there is always bleeding from the tumor. With the Mayo scissors we push off the bladder from its cervical attachment and expose the cervix anteriorly. With the bladder well retracted forward it is relatively easy to control the bleeding from the uterovaginal anastomosis. With the bladder separated and held out of the way with a Döderlein retractor we are able to cut into the vagina anteriorly. The vagina and cervix have already been sterilized. A Jacobs traction forceps catches the anterior lip of the cervix, and this is drawn upward, exposing the vaginal cuff which is to be cut through. This is again sterilized with a little iodine, as is also the vaginal wall. If the cervix has broken down, instead of iodizing the vagina and cervix as a preliminary it is far better to seal the ulcerated surfaces with the actual cautery before proceeding with the abdominal operation.

I have now been able to remove the entire cervix. By a suture we will whip the vaginal walls together and close the vaginal vault; this also controls the hemorrhage from the cut edges of the vaginal walls. If it does not, the hemorrhage can be absolutely controlled by tying the uterovaginal anastomosis. These sutures are left long and clamped, as they mark the centre of our operative field and act as traction sutures, allowing us to release the Jacobs forceps from the vaginal margin.

The next suture controls the uterovaginal anastomosis and attaches the pericervical tissues to the vagina. By bringing the base of the uteropelvic ligaments into the vaginal stump we are able to give the woman a better support and insure her against a prolapse of the vaginal walls. The supporting structures that hold the uterine

Digitized by Google

cervix in place are the uteropelvic ligaments and the uterosacrals; both of these are sewed, together with the round ligament, into the vaginal vault or cervical stump, and in this way we fortify ourselves against prolapse or inversion of the vaginal walls. In addition to this, before opening the abdomen we have already repaired the pelvic floor and so we have supplied the necessary supports. In tying off the uterine vessels, each of the vessels is caught and turned over again and tied a second time. In this way we can be sure that the individual vessels will not bleed, which is a great comfort to the operator. If a ligature breaks, there is, as a rule, no reason for it except that the surgeon has tied the second knot with too much force.

Having fastened the uteropelvic ligaments into the stump, we now take the round ligaments and sew these also into the stump, so that the vaginal vault is actually supported, by accurate suture, by the round ligaments, the uteropelvic ligaments, and the uterosacral ligaments, which we so carefully preserved when removing the cervix. The next step is to completely peritonealize the raw surfaces. This is done by picking up the posterior sheet of the broad ligament and sewing it to the anterior sheet, thus peritonealizing the stumps and covering all raw surfaces; this minimizes the danger from adhesions. Raw surfaces and blood-clots are the two most common causes of peritoneal adhesions. By leaving the anterior bladder reflection, I have sufficient peritoneum to completely cover the stump. Extreme care should be taken to have every point completely peritonealized, as a smooth, healthy peritoneum is one of the greatest factors in the limitations of infection.

We now let our patient out of the Trendelenburg posture. This should be done gradually, as the blood-pressure is immediately lowered on the assumption of the prone posture. In making the abdominal exploration I found that the patient has a retrocæcal atrophic appendix running over to the right abdominal wall. Such an appendix is a safe one to leave undisturbed.

At this point it is well to remind you of the importance of the sponge count. We have three checks on our sponges. The first count is made by the nurse who packs them. The number of sponges in use at a given operation is written on the blackboard. The second count is made by the nurse who doles them out to the instrument nurse who counts them as they are laid on the table. Then before

Digitized by Google

we close the peritoneum the instrument nurse is asked for the sponge count. The clean sponges are on the table, the soiled ones on a rack within view of the operator, and this count is compared with the count placed on the blackboard.

The peritoneum is then closed with a continuous suture of No. 1 catgut. After all the hemorrhage in the muscles is controlled, the rectus muscle is allowed to drop back into its fascial sheath and the anterior layer of the aponeurosis is brought in front of it by a lapping suture. Muscular or intramuscular hemorrhage is best controlled by a suture ligature.

Operative Findings.—The operative findings in this case are a bilateral laceration of the pubococcygeal bundles of the pelvic floor. On abdominal incision the gall-bladder was found distended but expressible, and there were no stones. The ducts were palpated and were not thickened. The appendix was atrophic, extracæcal, and subperitoneal. The uterus was enlarged to 12 Cm. in length by 7½ in breadth and 4½ Cm. in the anteroposterior thickness. The tubes were normal. Both ovaries showed atrophic changes. We have here an interesting finding. The woman is close to a menstrual period, and the blood can be pressed out of the tube. We can see the corpus luteum of the last menstruation in the end of the left ovary, and it is pretty well organized. The cervix shows a cystic, chronic, diffuse glandular hypertrophy, with marked erosion and eversion of the anterior lip. There is a small mucous polyp hanging from the anterior lip.

Diagnosis.—The diagnosis in this case is lacerated pelvic floor and chronic glandular cervicitis in the precancerous stage.

AMPUTATION OF THE CERVIX

This patient is twenty-four years of age, the mother of two children, the oldest being four years of age.

History.—Her family history is negative, save that her mother died of asthma. Her brothers are living and well. The patient's personal history is negative as to the diseases of childhood. Venereal infection is denied. She has had no previous operations.

Obstetrical History.—Her labors were normal and no chloroform was used. She remained in bed six days after confinement and gives no history of infection. She has had one miscarriage at three

Digitized by Google

months, one year ago, after which she remained in bed nine days.

Menstrual History.—Menstruation began at the age of fifteen years and was established at once. The flow is slight, lasts four days, and is associated with pain in the sacral region on the first day. Menstruation occurs every twenty-five days. There are no clots.

The patient's chief complaint is pain in both inguinal regions, which has progressively increased in severity since her miscarriage one year ago.

Physical Examination.—There is a unilateral laceration of the pelvic floor which involves the left levator. The cervix shows multiple laceration, with a notable degree of ectropion and infravaginal hypertrophy. The ectropion involves the vaginal surface of the portio, and there are diffuse cystic changes throughout. Notwithstanding the fact that this woman had a spontaneous labor, the membranes ruptured early and she must have had some infection. The multiple lacerations point to a dry labor, while the erosion and eversion are the result of infection. The traumatized cervix is easily infected, and this is followed by cystic changes.

The cavity of the uterus is 7½ Cm. in length, but the internal os is not patent to the curette. If the internal os is closed, then curettage is not indicated; conversely, if there is a uterine content, the internal os will be patulous. The cystic degeneration is the result of the inflammatory reaction caused by infection of the multiple lacerations. These two factors—that is, the ectropion with cystic degeneration and multiple tears—show that the woman must have had a dry labor with subsequent cervical infection. In a young woman like this one, in whom the normal dilatation was accomplished by the bag of waters, the tears would have healed had there been no infection. The only other explanation of the condition is that the physician who attended this patient at the time of labor attempted manual dilatation, or, in other words, he tried to hurry the labor.

Amputation of the cervix should be done: (1) In multiple lacerations; (2) in tears with great loss of tissue; (3) where there is cervical induration or hyperplasia; (4) in the presence of marked cystic degeneration; (5) where there is extensive erosion. Consequently the indications are for amputation in this case.

Digitized by Google

Operation.—The first step in the operation is to make a circular incision through the vaginal mucosa, around the margin of the ectropion. The vaginal mucosa is pushed back by blunt dissection until a cuff about an inch deep is freed. We then control the bleeding by applying a suture ligature to the uterovaginal anastomosis on both sides. With the hemorrhage controlled we are then ready to amputate the cervix by the use of sharp-pointed scissors. With the Jacobs traction forceps the cervix is drawn down the canal and excised as a conical wedge, taking care not to diminish the length of the muscle-tissue of the cervix. We endeavor to excise the cystic area and the glands in close connection with the cervical canal, and if our excision has been thorough we may cure the leucorrhœa. A leucorrhœal discharge is not from conditions in the uterus, but is due to a cervical inflammation. Do not get the idea that a leucorrhœa is from an endometritis; *it means an endocervicitis. Curetting the uterus never cured a leucorrhœa.*

Before completing the amputation of the cervix we have found that it is a good policy to place the two angle sutures so that the uterus may be pulled down by these as the traction forceps are released, for not only does this control the hemorrhage but it gives a better opportunity to accurately place the canal sutures uniting the cervical with the vaginal mucosa. We now establish a new cervical canal; in other words, we establish continuity between the mucous membrane of the canal and the mucous membrane of the vagina. This is done by an inverting stitch. An inverting stitch should be placed in front and posteriorly, since it is important that the vaginal mucous membrane posteriorly be accurately adjusted to that of the cervical canal. We control the bleeding from the cervical stump by a deep suture through the cervical muscle; each suture includes the muscle of the cervical stump, and the mucosa of the vagina. Now, after all the sutures are placed, the canal sutures which invert the vaginal mucous membrane are tied, and after they are tied the ends are left long and crossed; traction on these makes accurate coaptation of the cervical flaps, which facilitates tying the other sutures. Great care should be taken not to tie these sutures too tight, as when they become moistened they swell and cause constriction and tissue necrosis. A tight suture causes constriction of all the tissues within its grasp, and makes an irregular scar when healed. Unless

Digitized by Google

coaptation is perfect there will be raw surfaces with subsequent erosion, which will give rise to future leucorrhœa.

You may now notice the gaping vulva. We will follow the Emmett-Holden procedure. The first step is to expose the limits of the tear by placing "guy traction" sutures at the crest of the rectocele, at a point which can be brought to the meatus, and at a point just posterior to each caruncle, which corresponds to the remains of the hymen. By using care the orifice of the Bartholin duct may be avoided. These three points through which the guy sutures are placed when drawn together give us the size of the vulvovaginal orifice when we shall have completed the operation. A Kocher clamp is now placed at the centre of the mucocutaneous margin in the posterior commissure and denudation begun at the mucocutaneous junction. Then by blunt dissection with the Mayo scissors we are able to separate the rectovaginal septum. In this way we will be able to push back the rectocele to a point above the rectal angle. After the rectocele has been pushed off from its attachment to the postvaginal wall, we pass blunt-pointed scissors parallel to the vaginal wall along the ramus of the pubis and spread them; this exposes for us the levator muscle, or at least the pubococcygeal bundle of that muscle. The same is done on the opposite side. We now have the tissues of the pelvic floor isolated, and a suture of chromic gut is passed through both levators. Traction on this brings them into full view from the pubic attachment down. The one on the right side shows well all the way up to its attachment to the pubis, but the other is not so well developed nor so well brought out. The injury was to the left muscle. The whole restoration of the pelvic floor depends upon the individualization of the structures, and their consecutive coaptation upon the dissection and isolation of the structures and the union of these several structures one to the other.

Besides bringing together the deep muscles, suture of the pelvic fascia, particularly the triangular ligament and that part of the fascia covering the levator, is of great importance. The older operators, before Holden, of Johns Hopkins, devised this method of separating the individual structures and bringing the corresponding structures together, got remarkably good results from simple denudation and suture of the fascial plates. The results of such

Digitized by Google

operators as Emmett, Skene, and Sims are amazing, and all of us who have had the opportunity to follow patients operated on by these masters at times question whether the extensive dissection which we now employ gives any better clinical results.

There is no question that muscle attenuation does follow suture of these structures together, but it is not likely to be so pronounced if the fascial layers remain intact. The levator muscles coming down on each side are united in the median line in front of the rectum. The levators and their fascia are then attached to the vagina, not only in the centre but at each side by the angle sutures, and as a result there is very little abnormal tension. Before tying the sutures which bring the deep structures together we bring the three points at which the guy ropes are placed together with a silk-worm-gut suture and we close the vulvovaginal orifice. The reason we use the silkworm sutures in preference to the absorbable material is that it does not swell in the presence of the moisture from the vaginal secretions. So to bring the three points of the mucosa together a non-absorbable stitch has the advantage.

Having closed the vaginal surface, the levators are united in front of the rectum, and if these sutures are properly placed the rectocele will be absolutely obliterated. Rectocele is the result of a separation of the levators which allows the anterior rectal wall to be forced forward above the sphincter muscle. During straining it is the up-pull of the levators which straightens out the rectal angle during defecation. When these are separated, torn, or detached and the sphincter remains intact, the resistance is at the anus and the anterior wall above is pushed forward in the direction of the least resistance through the vaginal orifice. Repetition of this increases the size of the hernia between the levators, distending more and more the rectal pouch, covered only by the posterior vaginal mucosa. After the deep structures of the pelvic floor are closed with absorbable sutures we unite the superficial structures of the perineum, which include the transversus peronii, the bulbo cavernosus, and the external sphincter ani, together and attach them to the deeper structures with silkworm-gut sutures. We have tied our sutures so that we have perfect approximation without constriction. After all the sutures are tied we leave the ends long, and these are tied together. This has two advantages. In the first place, it facilitates their removal, and in the second place it does not leave

Digitized by Google

a short end to prick and annoy the patient. A two-inch strip of gauze is placed in the vagina against the cervix to control the little oozing that may take place at this point, and in order to facilitate its removal a silk thread is attached to it. Traction on this removes the gauze at the end of forty-eight hours, without pain or discomfort to the patient.

We will now turn the patient about and do any abdominal work that is necessary, since the woman has complained of certain additional symptoms incident to her uterine displacement and ptosis. Physical examination showed this condition of the cervix which we have repaired and also a retroverted, prolapsed uterus and a palpable pelvic cæcum. Her labor must have been long and tedious or the muscular tissues of the abdominal wall must have been of poor quality to have produced this wide separation of the recti muscles. This woman has an acquired ptosis, probably as the result of a very hard labor. She did not have an instrumental delivery, but she had extremely poor muscular power and the membranes ruptured early. She has a ventral hernia at the umbilicus, with wide diastasis of the recti muscles. For this reason I am making a median incision which will include the umbilicus, since our purpose is not only to reestablish normal pelvic conditions, but also to reëstablish the normal support of the abdominal walls. In other words, we are going to take a pleat in the fascia. This procedure was suggested by Dr. Clarence Webster, of Chicago. We will first take out the umbilicus, and this will give us the best opportunity to isolate the fascial layers. These tissues are so attenuated that there is no muscle between the fascia and the peritoneum. This case affords a very good demonstration of acquired ptosis. The small intestine is down in the true pelvis. The cæcum is redundant, but the transverse colon and stomach are not displaced downward.

After protecting the edges of the wound with moist, sterile towels we will place the patient in the Trendelenburg position. I am now lifting the small intestine out of the pelvis. The pelvis is for the sigmoid, the uterus, and the adnexa; the small intestines should not fill it as in this case. Ptosis of the small intestine becomes an important factor in the etiology of acute gastric dilatation after operation.

The patient has a normal ovary on the right side, with two corpora lutea. She complains of pelvic pain for the past two years,

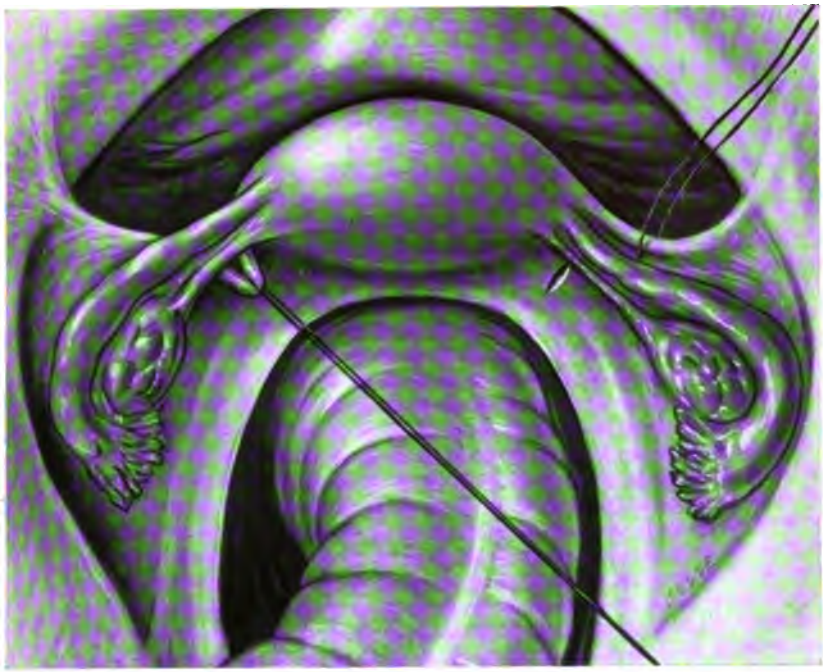
Digitized by Google

which increases as the day progresses, radiates down the thighs, and is relieved by lying down in bed. That is the kind of pain that one finds associated with varicosities of the broad ligament, and you will notice the size of the veins in the right ligament. We have a uterus which is displaced downward. In this case I am going to shorten the round ligaments in such a way as to elevate the uterus and at the same time give support to the ovaries. The left ovary is not diseased, but has two corpora lutea and is about three times the normal size. Such ovaries are frequently palpable and are operated upon and even removed because the operator does not understand ovarian pathology. I am going to do a Webster-Baldy operation.

In selecting a round ligament operation the important point is to notice the relation of the round ligament to the tube and what effect traction on the ligament has on the course of the tube. In folding the ligament, sharp angulation of the tube will result if it is closely attached to the round ligament. Before we learned this we saw two ectopic pregnancies occur in tubal angulations following Gilliam suspensions. We will raise the ovary and with a Cleveland carrier get underneath the utero-ovarian ligament and come out in the free space between the tube and round ligament (otherwise we would get hemorrhage) and bring the "guy rope" attached to the loop of the ligament through the hole in the broad ligament underneath the utero-ovarian ligament (Fig. 1). We repeat this on the opposite side and bring both ligaments behind the uterus as a sling (Fig. 2). The English call this the sling operation. A hook is now placed on the posterior uterine surface at the point just below where the utero-ovarian ligaments go into the uterus and the loop ligaments are sewn to the centre of the uterus, taking great care that the ligaments are not twisted as they are attached. These ligaments are now united across the back of the uterus (Fig. 3). The next thing we do is to pull out the distal portion of the round ligament and unite it to the lower margin of the posterior sheet of broad ligament just below the hole that passes through. This closes the opening in the broad ligament and peritonealizes it by turning in the torn edges of the posterior sheet, and this diminishes the chance of adhesion and hernia. By so placing the stitch we use the broad ligament as well as the round ligament to help keep the uterus forward. We now do the same thing on the opposite side. You see that we have the uterus sup-

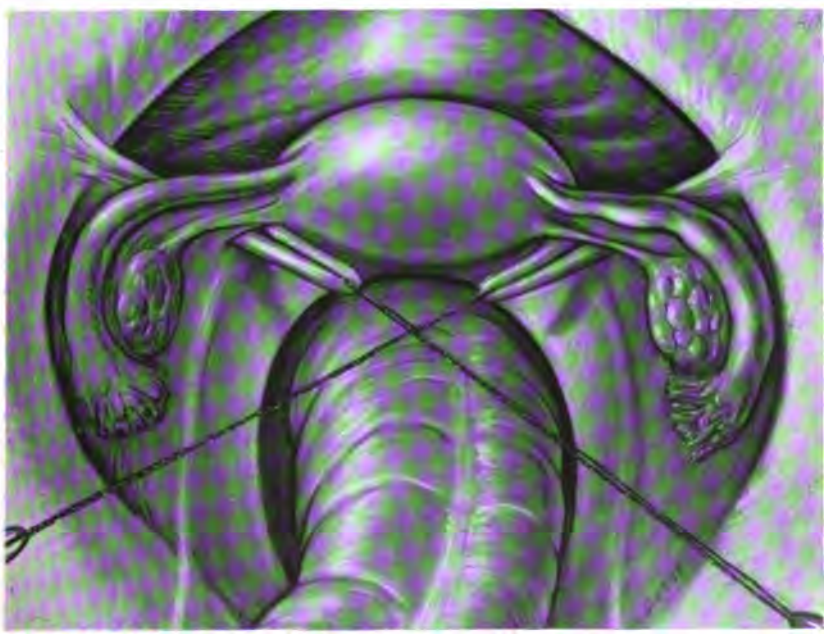
Digitized by Google

Fig. 1



Bringing the "guy rope" attached to the loop of the round ligament beneath the utero-ovarian ligament.

Fig. 2



Both round ligaments brought behind uterus as a sling.

Digitized by Google

Fig. 3

Both round ligaments united across the back of the uterus.

Digitized by Google

ported by the shortened round ligaments and the ovaries elevated by the round ligaments passing under the utero-ovarian ligaments.

This woman has a pericæcal or Jackson membrane and an appendix the tip of which is obliterated. The first step is the isolation of the appendix. Then its mesentery is grasped and a ligature is passed through the meso-appendix close to its base, tied, and the appendix cut free from its mesentery, and the appendix stump is tied after being compressed with forceps. This is done because three times out of one hundred the vessel runs on the inside of the appendix and a simple inverted ligature may result in a hemorrhage into the intestine. This was brought out by the late Dr. George R. Fowler. We invert the stump into the cæcal wall and bury it with a purse-string suture. Major Selig, of St. Louis, in a very large series of cases, showed that simple ligature of the appendix without inversion or peritonealization is all that is necessary. Wyeth also supports this view. We place the clamps just distal to the ligature and another clamp just above it, and then with a cautery we cut off the appendix. This sterilizes that part of the appendix which is to be inverted into the cæcal wall. Now we have the appendix well inverted and the entire surface peritonealized. We can feel perfectly safe that there will be no leakage from such treatment of the appendix. We will close the abdomen in layers, bringing the peritoneum together, isolating the recti and bringing them together and then lapping the anterior aponeurosis of the recti.

Observe how beautifully Doctor Beck is demonstrating the layers. I am cutting through the posterior fascial layer, which is the transversalis, in order to isolate the rectus muscles. We have demonstrated on one side the peritoneum, the transversalis fascia, the rectus, the anterior aponeurosis of the recti, the fat, and the skin, and we now control the oozing while we separate the layers on the opposite side in the same way. It is very important, to be successful in these cases, to have all the hemorrhage controlled, and we succeed in accomplishing this by using individual ligatures. In suturing it is very important to unite similar layers—peritoneum to peritoneum, transversalis to transversalis, etc. Every other stitch should pass through peritoneum, transversalis fascia, and one rectus muscle; this will strengthen the abdominal wall. The peritoneum and transversalis are sutured with fine chromic gut, the muscle with iodine gut, and the anterior fascia lapped with No. 2 chromic. This

Digitized by Google

technic is important in persons with marked diastasis of the recti muscles.

Now when we have brought the muscles together, we are in a position to bring the fascia together by a lapping suture. We will lap one layer of fascia over the other, and because of the length of the wound we will put in this lapped suture as an interrupted suture and in that way we can feel reasonably sure that the broad expanse of fascia, layer upon layer, will become adherent, and this will cure the hernia. It is not the muscle repair that cures a hernia. The muscle repair may fill the gap, but it is the fascial repair that cures the hernia, whether it is in the pelvic floor or the abdominal wall. By this lapping procedure we assure ourselves of a firm fascial scar. Provided the asepsis is satisfactory, the hæmostasis perfect, the suture material does not constrict, and like tissues are united, primary union should be obtained. These are the four elements upon which primary union depends. When a wound fails to heal we will always find that one of these factors has been defective. I have not cut off the extra skin in this case because I expect this woman to get stouter.

After-treatment.—While this operation is successful and will reëstablish the continuity of the tissues, continued after-treatment will be necessary for several months to develop the tone of the tissues. She will be taught how to sleep; she will be taught to sleep with the foot of the bed elevated. She will be fed the correct amount of food, and the abdominal muscles will be trained by proper abdominal exercises. She will be trained to take her abdominal exercise lying on a hard surface with her feet higher than her head and thighs flexed on the abdomen—first with one leg and then the other. After the tone of the muscles has been improved by daily systematic exercises, she will be placed in the elevated hip posture and a proper corset will be fitted on her. There is no place in surgery for a corset except as an adjunct to the abdominal wall. If a woman has a perfect abdominal wall she needs no corset, but if she has attenuated tissues they need support.

Now, as you remember in this case, the small intestines were in the pelvis. There was also a decreased inclination of the brim of the pelvis which allows prolapse because of the increase in intra-abdominal pressure. Ordinarily the axis of the abdomen is almost at right angles to the axis of the pelvic brim. This is brought about

Digitized by Google

by the position of the sacrolumbar joint or promontory. If we have a woman using no heels on her shoes and with an attenuated abdominal wall, with less than the normal lordosis, we have an obtuse angle at the sacrolumbar joint, and this allows a descent of the pelvic contents. In this case we had the long labor, the attenuated abdominal wall, the faulty pelvic structure, and diminished inclination of the brim which permitted the descent of the small intestines into the pelvis.

STERILITY

This patient is twenty-three years of age, a housewife. She complains of sterility and dysmenorrhœa.

Family History.—Her family history is negative, with the exception that her father died of Bright's disease.

Personal History.—The patient has a history of having suffered from swelling of the ankles and a gradual increase in the size of the abdomen since marriage.

Menstrual History.—Menstruation began when the patient was thirteen and one-half years of age, recurred regularly and lasted four days. The blood clotted and she suffered from pain on the first day.

She has also severe frontal headache. After marriage menstruation became irregular, lasting sometimes four days, sometimes six days, and pain is present the first and second days. She also complains of an intermenstrual discharge, which is increased by walking. She has had no miscarriages. The pain has gradually increased in severity and radiates to the sacral region.

This girl was perfectly normal. There was no change in the type of her menstruation until after marriage. Since that time she has complained of two symptoms—an increase in the comenstrual pain and a discharge. You may notice, as we expose the cervix, that there is a mucous, non-purulent discharge. After two years of married life she still has not become pregnant. A smear from the cervix shows a diplococcus, which is intracellular and stains Gram negative.

Before treating any case of sterility, we make it a definite rule, first of all, that the husband shall be examined, not only examined for potency, but for the quality of his potency, for we have learned through the work of Reynolds and our own clinical observation, that the activity of the spermatozoön depends on the straightness of his tail. Reynolds divides spermatozoa into several classes. The

Digitized by Google

one with the straight tail is able to penetrate these cases; those with curved tails have a lower virility.

The next point in reference to sterility is whether the man has had a previous Neisserian infection and whether he has infective gonococci now. We found that the husband of this woman has no gonococci at the present time, but he has a diplococcus which stains Gram positive, and upon further investigation we have found that he has a staphylococcus. The examination of the prostate showed pus and staphylococci. Such a man can infect the cervical glands with either staphylococci or diplococci, and this will increase the cervical secretions and leave this woman sterile. This woman has an endocervicitis, with glairy mucus and a small anteflexion of the neck of the uterus, so we will not attempt to pass a curette. There is no occasion to curette such a uterus.

Operation.—I am going to straighten the uterus by freeing its anterior connective-tissue attachments, as suggested by Reynolds. With the cervix drawn down by volsella forceps, an incision about an inch long is made transversely across the vaginal mucosa at the junction of the cervix and vagina. The bladder is pushed off the anterior vaginal wall and the connective tissue laterally freed from its attachment to the uterus. When this is done the uterus immediately straightens out. This is a dangerous operation for the novice because of the possibility of going into the bladder. Now Reynolds's idea is that anteflexion of the body and cervix is brought about by the contraction of the cellular tissues in front of the uterus, and that if one separates them from the front of the uterus the uterus immediately straightens itself. We can see this happen in this particular instance. We make the incision transversely and sew it up longitudinally, and by so doing we increase the length of the vaginal wall and throw the cervix back. Skene suggested doing the same thing years ago, only he did not separate the deeper structures; his was only a transverse incision through the mucosa, which he sewed up longitudinally, thus changing his anteflexions into anteversions by lengthening the anterior vaginal wall.

There is one objection to Reynolds's procedure, and that is that very frequently we get a scar in front of the cevix which produces dyspareunia. No case of sterility that gives a history of infection such as this should be curetted or have a stem pessary introduced,

Digitized by Google

as these procedures may be the means of spreading infection. We are not going to dilate the cervix in this case, but we will leave iodine-soaked gauze in the cavity until the completion of the operation. The infection in this case has apparently not passed through the uterus into the tubes, for if it had we would expect to find evidences of it in the tubes. If we can conserve these structures we will do more toward the cure of the sterility than by cleansing and stretching the cervix. In sterility there are a number of factors to be taken into consideration—potency of the male, the activity of the spermatozoön, the ovum, and the patency of the passages in order that they may permit the meeting of the ovum and the spermatozoön and the vaginal and cervical secretions. This woman shows a defective ovarian secretion as is evidenced by the accumulation of fat ever since her marriage. When we have an anteflexed uterus we always have a defect in the cervix in the developmental process. You may find a deep posterior invagination, or you may find a long, conical cervix, such as has been described by Sims, or there may be a very short anterior invagination which gives a relatively long posterior one. For the management of cervices with deep, posterior invagination, Dudley's discission of the cervix has a decided advantage and is an improvement over the Sims operation, which was simply posterior discission.

In comparatively few cases, with the exception of infravaginal hypertrophy of the cervix, is sterility due to mechanical conditions. As Doctor Beck can tell us, he sees in his clinic women with all kinds of anteflexions who become pregnant.

We will open the woman's abdomen to check up the ovarian and tubal findings. We first make a transverse incision through the skin and fascia and separate the fascia from the underlying muscles by blunt dissection, except at the point where the pyramidalis is exposed, where it is best to use the Mayo scissors. I very seldom make this transverse incision except in women who have not borne children and where I simply want to explore the pelvis. It gives a much less prominent scar than the longitudinal incision. We separate the recti in the median line to a point where the pyramidalis overlaps the insertion of the rectus. This is drawn to one side and the peritoneum is opened. We can now see very quickly whether the tubes have been damaged. Both tubes are adherent in the cul-de-sac. The uterus is now perfectly straight, the adhesions are

Digitized by Google

cobweb and easily separated. We now bring the tube up and we see that it is congested, but there is no gross lesion on the left side. The right tube is better than the left. The ovaries are adherent to the cul-de-sac and they show a microcystic condition. There is one interesting thing in an ovary like this: it is not the kind of an ovary that furnishes ova that become easily impregnated. Owing to the cystic condition many ova approach the ovarian surface at the same time, and the crowding together prevents them from maturing, so that they do not mature and become impregnated as easily as a single, large, mature ovum will, such as I showed you in the former case.

Now we will look at the appendix.

Coming back to the cervix, I wish to speak for a few minutes as to why it is not good to dilate this cervix. The deep posterior invagination demands an incision of the cervix, such as the Dudley operation. If we have a short anterior invagination we would do a Reynolds operation to lengthen the anterior wall. It is only in anteflexions of the body of the uterus that a stem pessary is indicated.

We will now count our sponges and close the transverse incision.

SALPINGITIS THREE YEARS AGO. SPONTANEOUS CURE

I am glad to have this case to show you at this time for comparison with the case we have just seen. The former patient had a gonorrhœal infection, but it did not get through the uterus and tubes, while in this case the gonococci have gotten through the tubes. This patient has been under observation for three years, and she now wishes to get married again and wants us to say that she may. The important point in the first case is that she has had a type of infection which, while it had passed through the uterus, is not going to damage the tubes irreparably. In that case I simply freed the tubes and I feel perfectly safe in leaving them.

This patient complains of right lumbosacral pain and discharge from the vagina.

Her family history is negative.

Personal History.—There are warts in the vagina and she gives history of having had gonorrhœa.

Menstrual History.—Menstruation began when she was thirteen years of age and was normal. It continued normal after marriage and childbirth. She has been married four years, but has not been

Digitized by Google

living with her husband. She has had one child, now three years of age, and no miscarriages. She began to have a discharge about five months after marriage, but no pain on urination, and her bowels were regular. She has been under observation in our clinic since her child was born, for nearly three years, with a definite gonorrhœal cervicitis, which infection has gone through the uterus. She had two sensitive and swollen masses on the back of the uterus, which as time passed have diminished in size. The pelvis at the present time shows no exudate. She has had, however, a double salpingitis and a pelvic peritonitis following her infection. This is definitely known.

Physical Examination.—The cervix is not torn at all, so there is no further procedure needed there. We will simply pack the vagina and explore the abdomen. The uterus does not come down, owing to the posterior parametritis. The first thing that happens when the tubes become infected is that they drop down back of the uterus and become agglutinated to the posterior surface of the uterus and broad ligament. The woman has a slight endocervicitis which I have iodized. We will now proceed to open the abdomen and we will show the results of nature's conservative processes in a double salpingeal inflammation. The report shows that the discharge is still positive as to intra- and extra-cellular diplococci; in other words, the woman has an infection of the endocervical glands. Now in the other case of gonorrhœal infection of the cervix the tubes were left in a perfectly patent condition, but the ovaries had an associated inflammation and a thickened tunic which caused arrested development of the ova. In this case we know that three years ago both tubes were involved and the woman had two masses, one on each side, in the cul-de-sac, lying on the uterosacral ligaments, and that the tubes at a recent examination were still tense and sensitive and somewhat thickened. Time has therefore been given for recuperation and regeneration of these tubes, and it is a question whether they are now patent. In a woman with gonorrhœal endocervicitis any manipulation near a menstrual period may cause an acute exacerbation of the pelvic inflammation. Such an exacerbation occurs near a menstrual period, because at that time we have a local congestion in addition to the chronic conditions. Because of the danger of lighting up the chronic condition we did not go into the uterus with a sound.

Digitized by Google

In separating the rectus muscle I find that the epigastric vein is injured and should be tied and cut. These women are very likely to have aseptic thrombosis during convalescence. Schenk has shown that most aseptic thromboses are due to trauma of these deep veins.

If there is such a thing as gonorrhœa curing itself, this is one of the most wonderful demonstrations of it I have ever seen. Here is the most beautiful demonstration I have ever had the privilege of seeing. Remember that this woman had two tumor masses in her cul-de-sac; diplococci, Gram-negative and intracellular, were found in the discharge coming from the cervix. We found the uterosacrals very thick. I am going to lift this tube out so that you can see that it has an open ostium and free fimbria. There have been attempts made by nature to close this fimbria. The cul-de-sac is practically free from adhesions. You noticed how the ovary was adherent and buried for a long time by the tube rolling over it. The right tube and ovary show little, particularly the tube; the left tube is more contracted at the fimbria and has developed a few cysts, and the ovary has been a long time in the cul-de-sac and in contact with inflammation, as is shown by its tunic. This girl's appendix is absolutely normal. The right uterosacral ligament is extremely thickened, and I notice on the right side that the rectum has become adherent to it. This is the evidence I have been waiting for for a long time, the opportunity of following a gonorrhœal salpingitis through years of conservative watchfulness, and then opening the abdomen to see the resulting pathology.

I am going to encourage this girl to be married, and it will be interesting to watch developments. I am going to have the husband examined as to his potency and find what kind of cocci he harbors, if any. The girl has been sensitized to her own cocci, but she may not be immune to a new kind of cocci, since it is only to her own cocci that she has produced antibodies. It will be interesting to see whether she could defend herself against the cocci of another individual and whether she can become pregnant. We are perfectly sure that this woman had a salpingitis three years ago, for we treated her at that time. Now it has all been absorbed and the tubes have regenerated themselves, except that the uterosacral ligaments are thick. In this case we have not disturbed anything. The tubes are patent and there is no sacculation, so the wound will be closed as I have previously described.

Digitized by Google

CLINIC OF VICTOR D. LESPINASSE, M.D.

WESLEY MEMORIAL HOSPITAL

Chicago

STERILITY

For a couple to be fertile, three structures must be present and normal, namely: ova, spermatozoa, and normal secretions of the uterus and cervix. A defect in any one of these structures may produce sterility.

To take up the subject in a systematic way, you may divide sterilities into those due to defects in the male, and those due to defects in the female.

The examination of the female is, as regards sterility, very uncertain. Clinically you can not find the ovum, so that we do not know and we can never tell when the woman is producing ova, the most essential female elements of reproduction. The woman whose sterility is due to some disease or malposition of the uterus or cervix can be determined easily by means of a gynæcological examination.

The woman whose uterine or cervical secretions are destructive to spermatozoa is easily determined, first by the changes of the reaction of the secretion to litmus; second, by the direct mixing of the vaginal or cervical secretions with the husband's semen on the hanging-drop slide, or, third—and undoubtedly the best method—to carry out the Huehner coitus test. This test gives us the real conditions to which the spermatozoa are subjected in their attempt to reach the ova and impregnate it. It is carried out in the following manner:

Intercourse is indulged in, and then the wife, without any douching, comes to the office, one to four hours after intercourse. The vagina is opened and the semen is removed from the vagina and examined. The secretion is next aspirated from the cervix and examined, and, if necessary, one can aspirate the secretion from the fundus of the uterus for examination. Normally the spermatozoa are killed by the vaginal secretions when they are mixed with it in an hour or less. If they are protected from the vaginal secretions by the clotting properties of the semen, they can live much longer.

Digitized by Google

Very lively motile spermatozoa should be obtained from the cervix as long as five hours after intercourse. If we do not find live spermatozoa in the cervix two or three hours after intercourse, we know positively that either the cervical secretions have killed the spermatozoa or the spermatozoa are congenitally weak.

To determine the vital strength of the spermatozoa, intercourse is indulged in, using a condom, and the specimen is brought to the office under constant temperature conditions of body heat. A slide is made and examined under high power. A specimen of normal sperm an hour old should travel across the high-power field in from two to four seconds; one two hours old in from five to six seconds. If there is much increase in this time, we know then that we are dealing with a case of weak sperm. If no spermatozoa are found in the cervix, but are found outside on the surface of the cervix, then we can feel sure that the mucus in the cervix is so thick that the spermatozoa can not penetrate it.

Now to come to the male: We have two chief causes of absence of sperm from the semen, namely: deficient production and deficient transportation. The productive types of defects vary all the way from absolute non-productive sperm to a practically normal specimen, and it is surprising how many cases you find in this group. You find them in individuals with a little bit of a hard testicle, usually with a normal penis, with no history of disease, but absolutely no sperm in the semen. If you open that man, you find that you have open channels and a perfect vas communicating with the urethra.

Your next case will be one with just a few spermatozoa, and these may be large headed or they may have the so-called thick neck, or they may have what I call wry-neck spermatozoa, head bent over, making an angle with the tail. Most of these spermatozoa are dead or the motion is very slow. They will move for a few minutes after they are passed, but motion ceases early under the best conditions. So you see these cases grade all the way from the very defective sperm up to the normal. As a rule, as the morphology of the spermatozoa approaches normal, you will find that the number of spermatozoa approaches normal. The spermatozoa markedly deformed are, as a rule, few, so if you count the spermatozoa in the

Digitized by Google

Fig. 1

Testicle, epididymis, and cord obtained post-mortem, showing absence of the tail and body of the epididymis. No clinical history is known of this specimen.

Fig. 2

Left testicle obtained post-mortem which shows the sequelæ of a previous epididymitis. Note the presence of adhesions between the tail of the epididymis and the testicle; also the partial obliteration of the testiculo-epididymis fossa. Also note the size of the head of the epididymis and compare it with the head of the epididymis in Fig. 3, which is the right testicle from the same individual.

Fig. 3

Right testicle from the same individual as Fig. 2. Note, first the size of the head of the epididymis—it is much larger than the left testicle; the adhesion from the head of the epididymis to the testicle; note that the testiculo-epididymis fossa is absolutely obliterated from slightly below the middle of the testicle to the tail of the epididymis. Also note the dense adhesions present in this region—an undoubted case of obstruction in the tail of the epididymis, whereas on the left side obstruction of the epididymis tubule had not taken place.

Digitized by Google

FIG. 4

Schematic drawing of testicle and epididymis from Case I. Note the size of the epididymis; its marked distention and the large number of dilated veins on its surface. No inflammatory adhesions of any sort present.

FIG. 5

Schematic drawing of the left testicle from Case II, which shows the lower half of the epididymis completely gone and replaced by a fibrous cord. The vas in this case was also completely absent, and probably the seminal vesicle.

FIG. 6

Schematic drawing of the right testicle from Case II, showing the complete absence of the lower portion of the body and tail of the epididymis, the presence of adhesions at the previous site of the tail of the epididymis, and the complete absence of the vas. Compare with the left testicle of the same individual (Fig. 5) and also compare with the epididymis of Fig. 4 and also with the specimen pictured in Fig. 1, obtained post-mortem.

Digitized by Google

specimen you will find that they will vary from two hundred million to nine hundred million for the total ejaculation.

For the weak-sperm cases we use artificial insemination. The rationale of this treatment is that a spermatozoön would be too weak to travel the entire distance from the vagina to the tube and overcome the hostile vaginal secretions, but it would have sufficient vitality to travel from the fundus of the uterus out into the tube, and all the time it is in secretions favorable to its life.

TECHNIC OF DIRECT UTERINE INSEMINATION

Our aim is to obtain a semen as free from bacteria as possible, consequently a condom should be boiled, and the penis should be washed with soap and hot water and rinsed in sterile water. After intercourse the insemination should be made as soon as possible.

I use a small No. 5 woven catheter, with an opening only at the end, which is made especially for this purpose for me by Eynard. This instrument will enter the smallest cervix, and usually passes readily into the fundus. Once in a while a little manipulation is necessary to pass the internal os, but, as the catheter is soft, no trauma is inflicted by these manipulations. So far we have never failed to pass any angulation or obstruction that we have encountered. From two to ten minims of semen are injected into the uterus, and then the catheter is removed. The injection should in no instance exceed ten minims, as any amount in excess of this is almost sure to produce uterine colic.

Case I.—The case that we have to operate upon to-day is one in which there are no spermatozoa present in the semen. We have been unable to find spermatozoa after the examination of three different specimens. The history of the case is as follows:

The young man is twenty-five years old. He was a seven-month babe, and has a double congenital inguinal hernia. There is nothing abnormal as regards his sexual desires or his sexual abilities. In fact, he thinks he is a little more passionate than most men. He has had no disease or injury of any kind to the genital organs. Seven years ago his hernia was treated by injections in the inguinal region. At the site of these injections one can palpate a small mass in both inguinal canals. The examination shows a normal testicle; in fact,

Digitized by Google

the testicle is a trifle larger than normal, firm in consistency, and with normal sensibility. The epididymis can be easily palpated and is distinctly enlarged. There are no definite fibrotic nodules palpable in any portion of the epididymis. The conditions on both sides are identical. Rectally the prostate is small and the vesicles were not palpable. (The amount of semen was very small: three-fourths of a cubic centimetre; prostatic bodies abundant, spermatozoa absent.) Our diagnosis is obstruction of the vas by cicatricial tissue, due to the injections practised for the cure of the inguinal hernia. This will explain the absence of the spermatozoa from the semen, but does not explain the small amount of semen and the relatively small prostate.

Operation.—Incision is made over the right spermatic cord just as it emerges from the external abdominal ring; the cord is picked up, spread out, and the vas searched for. With obstruction of the vas, you will find it distended, so when you expose it and look at it it looks as if filled with normal semen: a white, thick, creamy material that looks like normal sperm. Now when that material is examined you will find no spermatozoa at all, but numerous round rings which look like an emulsion of fat. The first few times that I saw it I was deceived by it, thinking it was so obviously normal secretion that it was not worth while examining for spermatozoa, and when I did examine it I found no sign of spermatozoa. What that material is I do not know. It does not take any of the fat stains. Several thickened veins were mistaken for the vas, but after a prolonged search and a careful spreading out of the entire cord and going over it, structure by structure, no vas could be identified. The tunica vaginalis testis of the right side was then opened and the epididymis presented as a large, oblongated mass, covered with numerous dark, bluish-purple veins and an occasional yellow spot. There were no distinct tubules visible through the capsule of the epididymis. Upon incising the epididymis capsule, over one of these yellow spots, and obtaining some of the secretion, it was found to contain no spermatozoa, but to consist of the emulsion-like fluid commonly found in the prolonged stenosed vas. The tunica vaginalis was then sewed around this opening in the epididymis tubule, aiming to form a sac for the collection of the spermatozoa. The testicle was dropped back into the scrotum and the wound closed. A similar

Digitized by Google

FIG. 7

Shows the non-productive case. Note the small testicles; note the right testicle is lower than the left. Note the disposition of the pubic hair, the large breasts, and the feminine configuration of the pelvis and thighs, also the small ankles and tapering calves, the long arms, and the large hands.

Digitized by Google

Digitized by Google

procedure was carried out upon the left side with absolutely identical findings: no vas, large, distended epididymis covered with numerous veins, and a large testicle of normal consistency. Sac operation was carried out on this side also.

The question now comes up as to what happened to this man's vas: whether it is a congenital absence or whether the vas had atrophied, due to interference with its nerve supply by the injection. What is the cause in this particular case? In my opinion, this case is one of congenital absence of the vas rather than atrophy due to the injection, because of the concomitant defects in the hernial ring and in the prostate. The small amount of semen points to the absence of the seminal vesicle; also, the absence of spermatozoa from the epididymis secretion argues for a markedly prolonged locking up of the secretions therein. I have never found this secretion in the vas where the obstruction had been present less than fifteen years, and, furthermore, the embryology of the parts confirms such a diagnosis.

The vas is formed from the excretory duct of the mesonephros, and the seminal vesicle is formed as an outgrowth from the tube. The epididymis and testicle are formed from the mesonephros itself. In the female the excretory duct atrophies and disappears. The ovary is formed from the same structure as the testicle. Hence in this male individual an atrophy has taken place, not only of his müllerian duct, which is normal for the male, but also the primary excretory duct has atrophied, a condition that is normal for the female.

Case II. (Not operated on in the clinic, but two days later).—Age forty-two; gonorrhœa when nineteen, very mild and no sequelæ. In 1892 had a perineal trauma which was quite severe. Married in 1896; one child born, died when three months old; married a second time in 1905, and his wife had a suspected ectopic pregnancy four years after marriage. Has been noticing that the amount of semen discharged has been gradually becoming less and less, until at the present time the amount of the discharge is practically *nil*.

The examination of the condom specimen shows ½ Cc. of semen with no spermatozoa and no increase in the prostatic bodies. The testicles were normal in size, the epididymis head is large, but in the region of the tail nothing could be felt that was positive. There

Digitized by Google

was certainly no fibrosis nor nodules. The prostate appeared to be normal. On the left seminal vesicle there were several rounded nodules about ½ Cm. in diameter, and on the right the vesicle was not palpated.

Pre-operative Diagnosis.—This was considered a questionable case as to etiology and as to location of the obstruction. A decision was made to expose the testicle and vas and locate the point of obstruction and remedy it if possible.

Operation.—It was decided to pick up the vas, as we do in vasostomy, first. In trying to find the vas and identify it through the skin, there was no structure palpable that we could identify as the vas upon either side. Consequently a free incision was made into the right side of the scrotum, the cord picked up, drawn out of the incision, spread out, and the vas searched for. The vas was not found. The testicle was then drawn through the incision and the tunica vaginalis opened; there was a slight hydrocele present, and the head of the epididymis came into view. This head was enlarged, had the identical appearance of the epididymis in the previous case, but at the centre of the body it ended, was rounded off, and the remainder of the body and the tail were replaced by a very thin velamentous adhesion. On the left side the conditions were the same as upon the right, with the exception that the epididymis from the middle of the body downward was not quite as completely atrophied as upon the right. There was a little thick band of capsule of the epididymis still present. The epididymis capsule was next incised over one of the yellowish spots and the epididymis tubules showed very well. They were opened and the material examined and found to contain numerous spermatozoa. A sac operation was performed upon both sides, the scrotum sewed up, and the patient put back to bed.

Here we have a case where the sexual tract undoubtedly was normal at one time. For some reason or other the tubules of the epididymis tail were gradually choked and were removed by absorption, likewise the vas disappeared. Experimentally, the epididymis tubule will withstand scar tissue very poorly. If a portion of the epididymis capsule is dissected off and a rather large surface of the tubule exposed, and that epididymis is examined a month or two following this procedure, you will find that the tubules have been

Digitized by Google

markedly compressed and partially destroyed. Evidently that is what occurred in this particular case. A sac operation was done upon both sides of this man, and we hope to obtain a pregnancy by the use of the material aspirated from this sac.

In connection with this case it is interesting to cite the following case, which was not operated upon, however:

A man had mumps eight years ago, which was six months after marriage. Wife was pregnant before the husband acquired the mumps. He had a bilateral testicular involvement as a sequel; the right testicle atrophied completely, and the left testicle showed a small painful nodule in the tail of the epididymis. This nodule would occasionally swell and be quite painful, and then the pain and swelling would disappear and the testicle would feel normal.

Six months after the first baby was born, and about a year after the attack of mumps, the wife became pregnant a second time. She had an abortion produced at the sixth month. Since that time there have been no pregnancies, but there have been several recurring attacks of pain and swelling in the left epididymis.

At the present time the examination shows a practically absent right testicle; a left testicle that is somewhat smaller than normal, with a normal head and body of the epididymis, and a distinct fibrous nodule in the tail of the epididymis.

The examination of the semen, made on two separate occasions, showed no spermatozoa whatever. Evidently this man's epididymis tubule was not destroyed immediately by the inflammatory process and the scar tissue which resulted, but with the repeated attacks of inflammation ultimately the lumen was shut off. Hence, between the first and some of the subsequent attacks that ultimately shut it off, a pregnancy was consummated.

Here we have two patients with an absence of both vas deferentia; one congenital absence and one an acquired absence of the vas, together with an acquired absence of the tail and lower portion of the body of the epididymis.

Digitized by Google

REPORT OF A CLINIC

HELD AT THE PRESBYTERIAN HOSPITAL AND BUSH MEDICAL COLLEGE

BY DR. HERMAN L. KRETSCHMER

Friday, October 26, 1917

Bilateral hæmaturia
Tuberculosis of the epididymis; epididymectomy
Enlarged prostate

BILATERAL RENAL HÆMATURIA

THE first case I would like to present for your consideration this morning is one of painless and symptomless hæmaturia.

There is no other single symptom of genito-urinary disease that is so frequently overlooked and the value of which is so often underestimated as is the presence of blood in the urine. If, instead of attributing the presence of blood in the urine to a cold or to exposure or fatigue, we would educate ourselves to the fact that hæmaturia means the presence of a pathologic condition somewhere in the genito-urinary tract, we would be giving our patients better service by starting them on the road to correct treatment early in the course of their disease.

Hæmaturia, with but very few exceptions, means organic disease in the urinary tract, and it is unfortunate that the importance of hæmaturia as a symptom is so often disregarded and belittled by both patient and physician.

The two problems which come up for consideration in every case of hæmaturia are: First, where does the lesion which is producing the hæmaturia exist? and, second, what is the nature of the underlying pathologic process that is producing the bleeding?

At times one can make a tentative clinical diagnosis in cases of renal hæmaturia that are associated with the passage of blood-clots down the ureter, which clots, in their passage, bring on an attack of renal colic. In the large majority of cases, however, such a diagnosis can not be made, because in so many instances the hæmaturia is painless and other urinary symptoms are absent.

It is necessary to differentiate between painless and symptomless bleeding. Hæmaturia associated with renal tumor may be painless.

Digitized by Google

The term symptomless is usually applied to the group of cases in which no cause for the hæmaturia can be demonstrated clinically. And it has occurred in our clinic that patients would present a history of urinary disturbance, suggestive of bladder disease, and upon closer examination it was demonstrated that the hæmaturia was renal in origin.

Each and every patient presenting a history of blood in the urine should be subjected to a routine examination of the urinary tract, and the one method that gives us more information than any other is the use of the cystoscope and the ureteral catheter. At times, however, cystoscopic examination and ureteral catheterization do not give the desired information, if the hæmaturia is renal in origin. If the blood comes from one or both kidneys, and the patient is examined in a free interval—that is, at a time when he is not actively bleeding—one may not be able to state which kidney is the seat of the bleeding. The negative evidence allows us to exclude the bladder as the source of the bleeding, and further study with the Röntgen ray, cultures of the urine, phthalein tests, and pyelography are necessary in order to determine the cause of the renal hemorrhage. On the other hand, if the hæmaturia is vesical in origin, it is quite simple to cystoscope the patient at any time and determine definitely the vesical origin of the hæmaturia.

Very often, however, we find many of these patients give a history of bleeding for one or two years. Instead of making or attempting to make an accurate diagnosis, vague and indefinite terms are used in describing the hæmaturia and styptic drugs are administered, after which both patient and physician wait for the bleeding to stop. The folly of this sort of management is apparent if one will bear in mind the fact that many of these patients are suffering from lesions, an early diagnosis of which is imperative in order to obtain the best operative results. Therefore the importance of making an early diagnosis in each and every case is particularly significant if we bear in mind the large number of cases due to new-growths and to tuberculosis, and it is especially in these groups of cases that early diagnoses must be made.

Many of the patients seen in the clinic give a history of having had hæmaturia for several years before examination. In going over a series of 238 consecutive cases of hæmaturia, I found that there

Digitized by Google

were 197 cases in which an accurate diagnosis was made. An analysis of these 197 cases shows that tumor formation was the most frequent single cause of bleeding. Tumors of the bladder were responsible 60 times, or 30 per cent. There were 25 cases of lesions of the prostate, 12 carcinoma, 13 benign hypertrophy, and one urethral tumor.

Tuberculosis was second in point of frequency as a cause of bleeding. There were 33 cases of renal and vesical tuberculosis, and the cases of vesical tuberculosis included those in which nephrectomy had been performed and those in which tuberculosis was secondary to lesions in the genito-urinary tract.

New formations of the kidney were third in frequency, being less frequently the cause of the bleeding than tuberculosis or nephritis. Of the 74 renal lesions which caused bleeding in this series, renal tumor was found 12 times.

If we include with the new-growths prostatic enlargement and carcinoma, there were 99 cases in which the hæmaturia was due to new-growths, or approximately 50 per cent. of the positive cases in this series. In other words, in a given case of hæmaturia, the chances are one out of two that the patient has a tumor formation in the urinary tract that may be the cause of the bleeding. While this statement may be a little dogmatic, nevertheless I believe it to be a good working principle, for if this serious side is impressed upon us, we will be more apt to make accurate diagnoses and try to determine the cause of the bleeding, rather than to administer medicines and drugs and allay the patient's fears by telling him there is nothing much wrong with him. As a matter of fact, these conditions are not appreciated by the general practitioner who usually sees and treats these patients first.

Calculi of the urinary tract were the next most frequent causative factors. A total of 32 cases were divided as follows: Kidney, 8; ureter, 10; bladder, 14.

Nephritis in this series produced bleeding in 12 cases. That nephritis may produce bleeding is a fact which is not very generally recognized, but that profuse hæmaturia may be the initial symptom of nephritis has been known and recognized for a long time. In several instances we have seen cases in which the first symptom was a painless hæmaturia and in which we were unable to determine a cause for the bleeding. These patients were kept under observation, and

Digitized by Google

gradually clinical symptoms developed from which a diagnosis of nephritis was made. Cases of nephritis, associated with hæmaturia, may even have attacks of renal colic.

Elsner, who has done a great deal of work on just this subject, believes that hæmaturia in nephritis may be a continuous symptom or it may recur at irregular periods.

Let us go over the history of this patient.

Miss C., single, aged twenty-two, was referred by Doctor Greer and admitted to the clinic October 22, 1917. This is her first admission to the hospital. She complains of two symptoms: (1) Blood in the urine, and (2) pain in the lumbar region.

Onset.—The patient complained of pain in the lumbar region during the months of August and September. She describes the pain as cramp-like, and states that it occurs at irregular intervals. Sometimes it occurs while walking, and it has occurred while she has been resting. During the past three weeks she has been free from pain. In July, 1917, she noticed for the first time that the urine was bloody. During July, August, and September she had to urinate frequently during the day, but this, she thinks, was due to the large amounts of water which she drank. She was examined by her physician, who found blood in the urine. There are no other symptoms, with the exception that the patient has had frequent attacks of sore throat. At present the patient is not having any frequency of urination or any urinary distress.

Physical Examination.—The patient is a well-nourished female with no gross abnormalities. Scalp and sinuses are negative. Pupils are equal and react to light and accommodation. Neck and throat are negative. The lungs show no areas of dulness, there are no râles, and the excursion is normal. The heart borders are within normal limits, there are no murmurs and there is no accentuation of the second pulmonic sound. The abdomen is negative; there are no areas of tenderness or rigidity. The liver and spleen are not palpable. The right kidney is palpable; the left is not. The blood count shows the following: Red blood-cells, 3,200,000; leucocytes, 13,750; hæmoglobin, 60 per cent.; blood-pressure systolic, 110; diastolic, 60. Röntgenographic examination of the urinary tract was negative for the presence of stone. All specimens of urine voided by the patient are bloody. Our problem in this case, therefore, is to

Digitized by Google

determine, first, the origin of the blood, and, second, if possible the cause of the bleeding.

The general physical examination, the Röntgen-ray examination, and the blood examination are negative. In other words, we have no clue upon which even a probable diagnosis may be ventured. Our next step, therefore, is to examine the urinary tract and see whether or not any cause for the bleeding can be found.

Cystoscopic examination, which we will now carry out, shows the following: The bladder is negative, except for the presence of a few small submucous hemorrhages which are situated around the right and left ureteral orifices; perhaps there are a few more of these hemorrhages around the left than around the right. There is no evidence of stone, tumor, or ulcer.

It is perfectly obvious, therefore, from this negative bladder picture, that the cause of the bleeding must be from the higher urinary tract, and we will therefore proceed at once to catheterize the ureters. Ureteral catheterization is carried out without any difficulty or obstruction. The catheter passes all the way into the renal pelves. The urine from both sides is slightly blood tinged. It is evident, therefore, that the patient is suffering from a bilateral renal hæmaturia. The most frequent bilateral lesions of the kidney that produce blood in the urine are nephritis and polycystic disease.

Stone, as previously mentioned, has been excluded by Röntgen-ray examination, or, at least, I think we are justified in stating that if a stone or stones were present, to produce bilateral bleeding of the severity with which this patient has had hemorrhage, we would be able to demonstrate them by the Röntgen ray. It is hardly possible for a bilateral tuberculosis to exist without bladder involvement and to find that both kidneys would bleed at the same time, and, furthermore, we have not found any evidence of tubercle bacilli in the urine.

Polycystic disease that would produce bleeding should give some evidence in the form of enlargement of the kidney. As you know, polycystic disease occurs as a bilateral disease and can be demonstrated by the irregular enlargement of both kidneys. This patient is a frail woman and her kidneys are not palpable as enlarged irregular kidneys, such as one would expect to find if she were suffering from cystic disease. The most probable cause for her bleeding,

Digitized by Google

therefore, is a nephritis, and we will send her back to the medical department with a diagnosis of bilateral renal hæmaturia, probably due to nephritis. In all of our cases of this type we culture the urine, and we will have cultures made from the urine of the left and right kidneys separately, as well as from the bladder.

P. S.—The cultures made from the urine have remained sterile. The leucocyte count of the urine showed 40 cells in the bladder; the right and left kidneys were negative. Subsequent examination in the medical department demonstrated the presence of granular casts, and on one occasion blood-casts were found.

TUBERCULOSIS OF THE EPIDIDYMIS; EPIDIDYMECTOMY

The patient is a male, aged twenty-three, who gives the following history: On August 27, 1917, while reading a meter for the gas company, he fell astride a box and injured the right testicle. He couldn't work that day and for the following two days. After 48 hours the swelling of the parts was such that it prevented his working. The swelling subsided, but has never entirely disappeared. When the patient is on his feet the swelling increases. A shooting pain radiates up the groin and into the back on the right side. The pain and tenderness have been about the same since the inset of his trouble. There is no urethral discharge, and the patient denies ever having had any gonorrhœal infection. He complains of a slight pain on urination. The family history is negative for tuberculosis.

Examination.—There is no urethral discharge. The testicle on the right side shows a nodular swelling in the tail of the epididymis, about the size of a hazel-nut. The vas deferens is enlarged and feels nodular. Rectal examination shows the prostate to be negative. The right seminal vesicle is thickened and more easily palpable than the left. Examination of the lungs for pulmonary tuberculosis is negative. The urine examination is negative. Repeated searches for tubercle bacilli in the urine have been negative. The prostate has been stripped several times to demonstrate the presence of pus, but this has been negative. The Wassermann test is negative. A gonorrhœal complement test is negative. There are no clinical evidences of gonorrhœa. His wife has had no miscarriages and has had three healthy children.

The differential diagnosis is one which in this case, it seems to

Digitized by Google

me, must rest between syphilis, gonorrhœa and tuberculosis. Syphilis, as a rule, begins in the body of the testicle, and not in the epididymis. Other evidences of syphilis, such as a positive Wassermann test, a history of miscarriages in the wife, being absent, we may feel quite reasonably safe in excluding syphilis.

The absence of a urethral discharge, of pus in the prostate and of pus in the urine, and the presence of a negative gonorrhœal complement test would justify the exclusion of gonorrhœa.

A possible infection of the epididymis due to other organisms than those just considered may be excluded from the long duration of the disease and the fact that the patient has been treated with wet dressings, rest in bed, and the use of a suspensory. He has been sick for ten or twelve weeks without any material change in his local condition.

The points in this case which would justify us in making a diagnosis of tuberculosis are the following:

1. The history of trauma.
2. The failure to respond to treatment for epididymitis.
3. The presence of a persistent nodule in the tail of the epididymis.
4. The enlarged, hard, nodular, beaded vas deferens and thickened seminal vesicle on the corresponding side.

In a case such as this the diagnosis, as a rule, is not very difficult. In the acute cases of tuberculosis of the epididymis the patient may have a good deal of pain, swelling, redness, and local tenderness, which make a differentiation from gonorrhœal epididymitis difficult. In the later cases, when there is tuberculosis of the prostate and both seminal vesicles, the diagnosis is relatively easy, and in the very late cases, in which there has occurred suppuration with the formation of sinuses, the diagnosis is quite simple.

The diagnosis is much more difficult in cases which have followed or have been complicated by gonorrhœal infection. Gonorrhœal infection often stirs up a latent tuberculosis of the epididymis. In instances in which patients come in with acute swelling and pain in the epididymis and in which there is an associated discharge, unless there are other evidences of tuberculosis in the prostate or vesicles, the tuberculous process may be overlooked. The patient may have had a slight nodule in the epididymis which he has over-

Digitized by Google

looked; he acquires a gonorrhœa which is complicated by an epididymitis, and this is usually interpreted as being due to an acquired gonorrhœal epididymitis. In due course of time and under the usual treatment the patient's epididymitis, however, does not respond, and it then becomes evident that he has a complication of the two.

Tuberculosis of the epididymis, I believe, is always secondary to a tuberculous focus elsewhere in the body. Where patients have an evidence of tuberculosis of the lung, or a healed tuberculosis of the lymph-glands, or a tuberculosis of the bones and joints, one has no difficulty in demonstrating the presence of a primary focus. However, this is not always possible. Tuberculosis of the epididymis, I believe, while always secondary to a focus elsewhere in the body, may be primary in the genito-urinary tract, the tubercle bacilli being conveyed to the epididymis through the blood-stream. There are some, however, notably Keyes, who claim that tuberculosis of the epididymis is secondary to tuberculosis of the prostate, and that the prostate is the primary focus of involvement in the genital tract.

I believe that these cases of tuberculosis had best be treated by operative procedure. It is true that some of the patients have apparently done well on tuberculin, fresh air, hygiene, etc., yet I feel that they may still harbor tubercle bacilli in the apparently healed focus. I remember one instance in which a patient refused surgical interference, and in which we were compelled to use tuberculin. This patient had a bilateral tuberculous epididymitis, and after being on tuberculin for several months, and his condition showing marked improvement, he disappeared and sent in word that he considered himself well. Three years later, following an injury to one of his testicles, an abscess formed in the epididymis, which I incised, and in the pus we found a great many tubercle bacilli.

It seems to me that the logical thing to do is to remove the epididymis with the vas deferens as far as one can conveniently remove it, and, as a rule, I remove the vas as high as the internal ring.

Technic.—I am dividing the skin and dartos. I am now opening the tunica vaginalis; I turn the testicle inside out and carefully inspect the serous coats. We do not have any evidence of tuberculosis on the tunica vaginalis, either on the parietal or visceral layer. The head of the epididymis appears perfectly normal, as does the body,

Digitized by Google

but in the tail, or at the junction of the tail with the body, we can feel the large, hard nodule which was felt before. I usually begin removing the epididymis at the inner angle. I am beginning below and isolating the lower pole first. After removing the epididymis, that part of the testicle which lies against it should be observed to determine whether invasion of the body of the testicle has taken place. Histologic evidence of tuberculosis may be found in a testicle which has been removed but in which there is no gross evidence of tuberculosis. In this case we find the tunica vaginalis is perfectly free.

Now the upper pole is carefully dissected off. Often one is able to get most of this off by sheer blunt dissection. The epididymis is now removed from the body of the testicle. As much of the vas deferens as is possible should be removed. Occasionally I open the inguinal canal and remove the vas down to the internal ring. I have this freed down to the tail, in which is located the previously described nodule. The line of separation is quite clear.

The incision is to be extended as high as the external ring, and we sever the vas deferens at that point, preparatory to its removal. Both the complete epididymis and the vas, up as far as the external ring, have now been removed intact. The end of the stump is cauterized with phenol. The removed specimen is to be carefully preserved and examined histologically, on account of the medicolegal character of the case. The cut edges of the tunica vaginalis are drawn over it, and its cut edges are sutured. There is no excuse for castration in early tuberculosis of the testicle. Epididymectomy offers the best results.

ENLARGED PROSTATE

The third case I should like to present this morning is Mr. B., aged sixty-eight, who gives the following history: In 1886 he was operated upon for stricture, for which an internal urethrotomy was performed, since which time he has occasionally passed a sound. His present complaint is painful and frequent urination. The frequency of urination is variable. Sometimes he does not get up at all during the night, and at other times he is obliged to arise several times. For the past ten days he has been getting up from five to seven times each night. The pain is described as being of a bearing-

Digitized by Google

down nature, and seems to be located in the pelvis. At times it is so severe that it results in a bowel movement, which gives him temporary relief. The pain at times has been irritating and seems to radiate along the urethra, beginning in the neck of the bladder. During the past six months he has had more or less dribbling at the end of urination. The force of the stream varies, sometimes being quite strong, but more frequently it lacks force. Hesitation and difficulty in starting the stream have been present for several years, and it is necessary for him to wait a long time before he can finish the act of urination. There is a rather indefinite history of hesitation. The patient states that after he first voids he passes a small amount and the flow stops; after waiting awhile it starts again, and the amount passed at this time is variable. The patient does not empty his bladder, and he informs us that his family physician passed a catheter and found a residual of 9 ounces.

Examination.—The eyes react to light and accommodation, and the knee-jerks are brisk. Heart and lungs are negative. The abdomen is negative except for the presence of a tumor above the symphysis, evidently due to a distended bladder.

Rectal examination shows the prostate to be uniformly enlarged and smooth. There are no areas of tenderness, but the entire prostate seems sensitive. The consistency is that of an ordinary adenomatous hypertrophy. The seminal vesicles are both palpable. There were 11 ounces of residual urine.

Cystoscopic examination shows the presence of two enormously enlarged lateral lobes which project into the bladder, with a distinct notch formation above, and at the base of the bladder was seen a small median lobe. The bladder shows a severe general cystitis and a very marked trabeculation. In one or two areas formation of diverticuli was seen.

The Röntgen-ray examination showed the presence of a small shadow in the region of the left kidney; it is very small and is compatible with stone in the left kidney.

Urinalysis showed the presence of albumin +, blood +, sugar 0, sp. g. 1.015. Microscopic examination showed many, many pus-cells, a few epithelial cells, and a few red blood-cells. Cell count showed 18,000 leucocytes. Cultures showed the presence of staphylococci and *Bacillus coli*. The phenolphthalein test showed the elimination in one hour of about 59 per cent. His blood-pressure was 175.

Digitized by Google

From the findings it is perfectly evident that we were justified in making a diagnosis of benign hypertrophy of the prostate, and advised the patient to have his prostatic condition treated. Owing to the presence of the large amount of residual urine and because of the presence of the severe infection, it was decided to try and clear up his bladder condition before doing a prostatectomy. The patient was first put upon regular, systematic catheterization, followed by irrigations of the bladder which did not seem to clear up the condition very much. It was then decided to resort to the use of an indwelling catheter, but the patient could not tolerate this, and he was advised to have a suprapubic cystostomy for drainage, which was carried out under local anæsthesia a week ago. We will now, therefore, operate upon this patient and remove his prostate under a short ether anæsthesia.

Technic.—I will introduce this curved artery forceps through the suprapubic opening, which you see, in order to enlarge the opening so that it will permit the introduction of the finger. Then I introduce my finger through this opening and begin at once with the enucleation. In this type of case I believe that the prostatectomy should be a rapid one, and that at the very outside four or five minutes are all that should be required to remove the prostate.

I have freed the prostate on the left side and will continue the dissection with my finger on the right. Now I have the prostate entirely freed and will remove it with these lobe forceps. Here you see the specimen; here are the two lateral lobes and here is the smaller median lobe, verifying our cystoscopic diagnosis.

I will now enter the cavity once more, to be sure that nothing has been left behind. One can be pretty sure of this when the dissection is as clean cut as this one was, but it is always better to enter again and be positive. There is not very much hemorrhage; nevertheless, I shall pack the cavity from which the prostate has been removed rather tightly with iodoform gauze, which we will begin removing at the end of 24 hours, so that at the end of 36 or 48 hours all of the gauze has been removed. The time consumed has been two minutes, and we feel perfectly confident that this patient should get along without very much trouble. When patients have had such a short anæsthesia and are able to take their supper and are able to continue taking large quantities of fluid, which is so important in this group of cases, the results are usually favorable.

Digitized by Google

SURGICAL CLINIC OF DR. FRANK H. LAHEY

AT THE BOSTON CITY HOSPITAL, BOSTON, JULY 25, 1917

Kidney calculus Ureteral calculus

KIDNEY CALCULUS

THIS case is an unmarried girl, nineteen years of age. About two months ago she was awakened by an acute pain in the left loin. The pain lasted for a week, being worse at night and moderating in the morning. It has recurred almost daily since. It does not radiate and has no relation to meals. Urination is painful at times; she has noticed no change in color of urine; she has been incontinent since she was operated on for a stone in the bladder some years ago. Since having pain she has vomited several times without relation to the taking of food. The digestive history and the cardiorespiratory history are without significance. She has no dysuria and no hæmaturia. Her menses began at fifteen, are not irregular and not painful. Her family history is unimportant.

Past History.—She had diphtheria, measles, and chicken-pox when young. She was operated on for stone in the bladder when two years old. Her physical examination is generally negative except for costovertebral tenderness and tenderness in the loin on bimanual palpation. White blood count on admission was 11,000; hæmoglobin, 80 per cent. Temperature elevated to 101½° in the afternoon. Urine: pale, acid, 1.010, trace of albumin, no sugar; sediment contains numerous red blood-cells, squamous and pus-cells, and numerous oxalate and phosphate crystals.

This girl has had an X-ray taken and shows what we consider to be a stone in the kidney (Fig. 1). The shadow is on the left side, opposite the third lumbar vertebra. Here is the shadow which we think represents the stone.

The next X-ray (Fig. 2) illustrates the method of demonstrating by means of the radiograph catheter whether the shadow is that of a stone or a calcified lymph-gland such as is shown in Fig. 3.

Notice in the X-ray of this case (Fig. 2), in which I have passed a

Digitized by Google

radiograph catheter up into the pelvis of the kidney, that the tip of the catheter is pointing directly at the stone. This, together with the clinical history and findings, we consider makes the diagnosis practically certain.

By way of further explanation, I wish now to call your attention to this other X-ray (Fig. 3) of a patient whom I demonstrated in this clinic last year. An X-ray had already been taken for reasons in no way connected with a kidney lesion: however, because of the shadow which you see here beside the radiograph catheter, a diagnosis of renal calculus was made; that is to say, such a diagnosis was considered probable on the first X-ray. This, the second X-ray, was made after I had inserted a radiograph catheter, with the result which you see here. Notice that the catheter passes considerably beyond the shadow and quite a distance to one side of it. For these reasons, taken with the absence of clinical history and findings, we felt justified in assuming that this shadow represented a calcified gland.

These two cases, I think, well represent the value of confirming the diagnosis of stone by the introduction through the cystoscope of radiograph catheters, for, if such a procedure be practised, there will be little danger of misinterpreting an X-ray and doing an operation which is unnecessary and can not relieve the patient.

Inasmuch as this patient has been having pain and irregularly elevated temperature, we are considering the question of nephrectomy, and if we find a kidney which is badly infected or destroyed, that is the procedure we shall practise. For this reason we have attempted to ascertain, first, whether she has another kidney, and, second, by means of the phenolsulphonephthalein test, whether it is competent to carry on alone all of the urinary excretion.

As evidence that she has two kidneys, I have found two normally situated ureteral orifices, and, through the cystoscope, I have passed two ureteral catheters up to the kidney pelves. Through these catheters have come urines of entirely different character. From the left comes a pale, watery urine in considerable amount, containing pus-cells and normal blood. From the right comes a normal amber-colored urine containing no abnormal elements. From these facts we feel quite safe in presuming that the patient has two kidneys.

The phenolsulphonephthalein excretion from the right kidney has been found to be within normal limits.

Digitized by Google

Fig. 1

Stone exaggerated by dark line around it.

Fig. 2

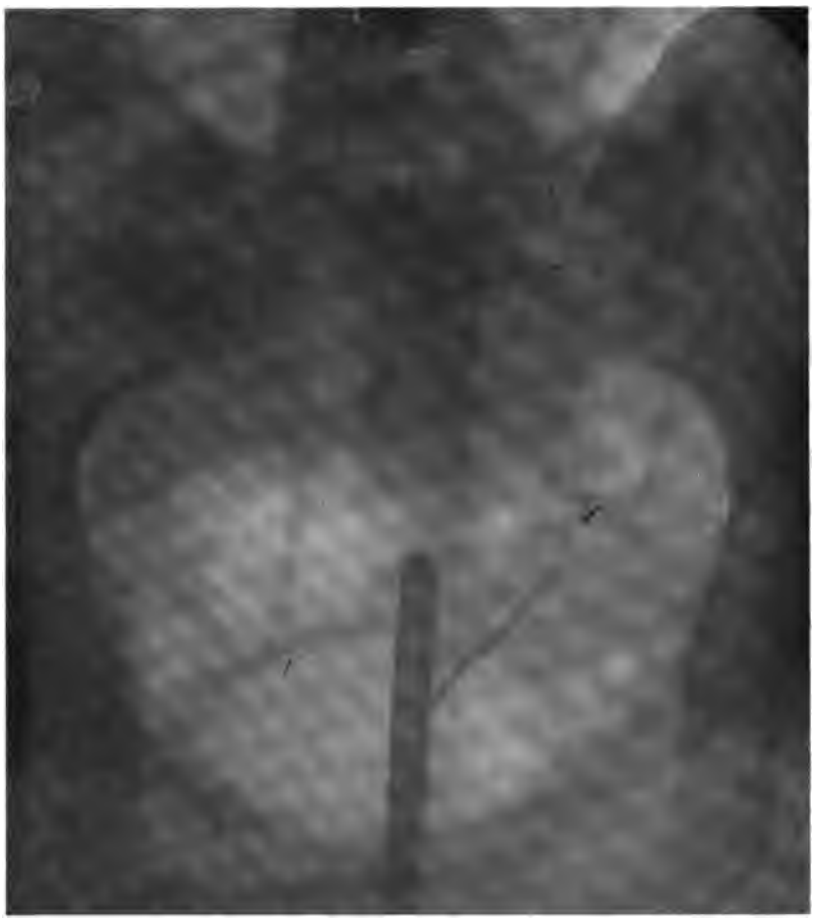
Same as Fig. 1, but with radiographic catheter pointing to stone.

Fig. 3

Calcified gland in the radiograph, with catheter passing it.

Digitized by Google

FIG. 4



The shadow of the ureteral stone, with the tip of the radiographic catheter resting against its lower end.

Digitized by Google

Before starting with this operation I shall summarize the findings on this case:

First, we have a clinical history, a past history, and clinical findings strongly suggestive of stone in the kidney. Next we have demonstrated by X-ray a shadow in the region of the kidney pelvis, and, furthermore, by means of radiograph catheters, that the shadow is within the kidney and not a calcified gland. Next we have demonstrated that two kidneys exist, and, finally, we have demonstrated that the function of the unaffected one is consistent with that of a kidney capable of bearing the whole load of urinary excretion if it is considered wise to do a nephrectomy.

(Patient is brought in under ether.)

The girl is on a kidney table, on which there is a bar which elevates at the centre so that her body is sharply angulated; the distance between the last ribs and the crest of the ilium is thus exaggerated as much as possible. We shall now make an incision running from her last rib down to the crest of the ilium and parallel with the edge of the quadratus lumborum. Notice the curve of the incision at the bottom, which gives us a little more room than a straight incision would. We go through the superficial muscles and come down immediately to the lumbodorsal fascia, finding very little bleeding.

On X-ray examination it was thought by the röntgenologist that this kidney was considerably larger than normal; he was able to demonstrate the shadow of the kidney very distinctly. We now see the kidney surrounded by the delicate renal fascia, which we incise. There is the surface of the kidney. It feels considerably larger than normal. We now try to free the fat from the kidney and deliver it. I am separating the adhesion to the upper pole by blunt dissection with my finger, taking care not to tear anything roughly, and am gradually getting the pole free. Delivery of the kidney is not easy; it is prevented from coming up by adhesions at the lower pole, and those I must gently liberate. Since I am having so much trouble with the lower pole, I think it would be wise to increase the length of the incision. The kidney is now delivered upon the loin and, as you can see, is abnormal in shape. I can not feel a stone in it yet. There are a great many indurated glands about the pelvis. Here is apparently a cystic and broken-down area, and the kidney seems to have multiple areas of softening. On feeling along the course of the ureter I can

Digitized by Google

perceive no stone; however, I think I feel a stone here, just in the beginning of the pelvis of the kidney.

Now this girl has had so much trouble and this kidney seems so much destroyed that I do not think it worth while to try to save it. Here is the ureter, which I pick up on a pair of hæmostats. You can see it plainly. We first clamp the ureter in two places and cut it off. Here is the cut end of the ureter on one side; there is the cut end on the other. We will now gently wipe off the pedicle so that the renal vessels are demonstrable. There is the renal artery; you can see it coming in at the top, and below is the renal vein. Care must be taken, in ligating these vessels, lest we tear the renal vein, only too easily damaged. I will have a kidney clamp. This clamp has a curve which permits it to cross the pedicle of the kidney completely. Since this kidney is so large that it interferes with my ligating, I shall clamp it, cut it away, and ligate the vessels afterward. This bleeding is back-flow from the kidney itself.

Here is the specimen, with the stone right at the bottom of the pelvis; there is the ureter as it goes in. There is the stone directly inside of the pelvis. There is the stone blocking the ureter. I could have removed this stone very easily through an incision in the pelvis, but this kidney has bothered this girl so much and is involved in so much inflammatory process that I think it wiser to sacrifice it than to take chances with the infection which is already present. I will cut this pelvis open a little more so that you can see the stone as it lies directly within and pass the specimen around. Please save it to be sent to the pathologist.[1]

Here is the pedicle of the kidney. We will ligate it with heavy silk, and the operation will be completed. We now have the pedicle surrounded with silk, and we tie it securely. The pedicle is ligated now; notice that I tightened the knot by pulling apart with one thumb knuckle resting against the other, and not by pulling upon long ends of the ligature. If you take hold of the end, the strain is largely upon the strand, but if you tie thumb to thumb you will make it very secure, for all of the strain goes to tighten the knot. There is no bleeding; the pedicle is securely ligated. Here is the ureter, which we will tie. You see, I could wipe this ureter out for a considerable dis-

[1] The pathological report was pyelonephrosis, with small stones the size of duck-shot scattered through the calyces.

Digitized by Google

tance if it were involved in a tuberculous process. We must tie the ureter securely, because occasionally in inflammatory processes there is a backflow of urine from the bladder through the chronically inflamed ureter. Next we will look the field over for possible bleeding vessels, and, if any are found, tie them with plain catgut. There is no bleeding.—Let me have a small piece of rubber dam.—This is a large hole, so that for a few days it may be wise to allow a piece of rubber dam to drain off any accumulation of serum. I think you can now see from the specimen why it does not secrete phenolsulphonephthalein. You can see the kidney is inflated, necrotic in areas, there are glands about the pelvis, and the stone is just above the junction of the ureter with the kidney pelvis. The rubber dam will be taken out at the end of two or three days, and this girl should be able to leave the hospital in about three weeks, possibly before.

URETERAL CALCULUS

The next case this morning presents the following history and findings: The patient is a girl, nineteen years old, unmarried. Within the last five months she has had several attacks of sharp pain, localized in the right lower quadrant. The attack generally lasts for a day and then goes away. At the time the pain comes on she usually becomes nauseated and vomits, but never vomits except during an attack. Appetite good. Frequently belches gas after eating. Bowels constipated; sometimes several days elapse without a movement. Never jaundiced. Cardiorespiratory systems, negative. No nocturia; dysuria on several occasions lately; no hæmaturia. Menses started at fifteen years; always regular, painless, the flow lasting five days. No excessive use of tea or coffee. Parents and one sister living and well. No family history of cancer, tuberculosis, or insanity. Patient had measles and mumps when a child; otherwise always healthy.

Physical examination shows a well-developed and well-nourished girl. Eyes, nose, and teeth negative. No palpable glands and no rigidity of neck. Chest, lungs, and heart negative. Extremities negative. Knee-jerks present and equal.

The urine shows a slight trace of albumin; acid, 1.016; few leucocytes; many red blood-corpuscles; no casts. Renal function, 45 per cent.

Because of the dysuria and the number of red cells in the urinary sediment, we were led to submit this girl to an X-ray examination.

Digitized by Google

At this point I wish to impress upon you the fact that ureteral stone is often mistaken for appendicitis. We have had several cases of ureteral stone in which the appendix had previously been removed: in those cases it is more than likely that the original cause of the trouble was the ureteral stone and not the appendix. Let me therefore caution you of the need for a thorough urinary and X-ray examination of patients with suspected attacks of chronic appendicitis.

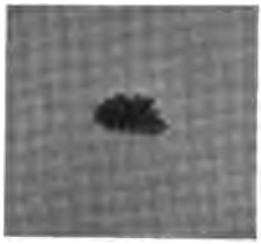
The report from the X-ray department is probable stone in the ureter and stone in the kidney. Here is the X-ray (Fig. 4), showing what was considered by the röntgenologist as a stone in the ureter close to the entrance of the ureter into the bladder. The X-ray diagnosis, you will observe, was "probable stone in the ureter." The report is worded in this manner because of the frequency with which phleboliths in the pelvic veins simulate ureteral stone. They are usually situated a little farther away from the edge of the sacrum and are often multiple. Because of this possibility of error, we did not care to advise operation upon the patient until we could definitely assure her that she had a stone in her ureter and that accordingly, by removing it, we could relieve her of the symptoms. To prove that it was a ureteral stone we again made use of the cystoscope and ureteral catheter. In this X-ray you see the radiograph catheter which, by means of the cystoscope, I passed up the ureter until it met obstruction. The X-ray was then taken; you can here perceive the tip of the catheter resting against the stone. We consider this quite conclusive evidence of a ureteral stone and therefore feel justified in advising its removal. We are further led to advise removal of this stone because the röntgenologist reports that the patient also has a stone in her kidney. We wish to remove her ureteral stone first, because we want the ureter wholly healed and free from obstruction before we undertake the removal of the stone from the kidney.

If we should remove the kidney stone first, we fear that we might have a urinary fistula in the lumbar incision, the urine finding an easier exit by that route than down the partly obstructed ureter.

We probably could remove both stones at this operation, but prefer the more conservative procedure of accomplishing the removal of the ureteral obstruction before undertaking the kidney stone. Following the removal of this ureteral stone, we shall wait until the ureter and the abdominal wound have entirely healed—a period probably occupy-

Digitized by Google

FIG. 5



Photograph of the ureteral stone. Exact size.

FIG. 6

Stone in the ureter, with radiographic catheter pointing to it.

Digitized by Google

Digitized by Google

ing about two weeks—and shall then undertake the removal of the stone in the kidney with no fear of the urine backing up and the consequent formation of a urinary fistula in the loin. As has been stated, in some clinics it is the custom to remove both such stones at the same time, but, for the reasons just given, we shall to-day take out only the ureteral stone.

You might ask, If this girl did not have a stone in her kidney, would you operate upon the stone in the ureter? and in this case I would answer yes, because she has had distressing symptoms over a period of five months. Yet many small ureteral stones are passed into the bladder and from there passed *per urethram*. I have several times washed them out through a cystoscope after an attack of ureteral colic. We believe that operation should be advised in the cases suffering from distressing symptoms (pain) over any considerable period of time, in those cases in which the X-ray demonstrates the stone to be of such size that it is unlikely to pass, and in cases such as this patient, in which stones in the kidney (particularly the pelvis) must be removed also.

(The patient is brought in under ether.)

We make a low right rectus incision along the outer border of the rectus, just as for an appendectomy, but will not open the peritoneum. You will observe that we have gone through the anterior sheath of the rectus, pulled the muscle slightly inward, and have arrived down to the peritoneum. The peritoneum is next freed from the abdominal wall, care being taken not to open it, and it is being stripped back until we are lifting off the parietal peritoneum from the post wall of the right iliac fossa. At this point we shall find the ureter. At the level of the right iliac fossa the ureter is intimately adherent to the parietal peritoneum and strips off with that structure when it is elevated from the posterior abdominal wall.

Here is the ureter with its accompanying vessels; we follow it down into the pelvis, stripping the parietal peritoneum back toward the median line to the point where, as you can note, we have the iliac vessels exposed and showing the ureter as it crosses them at this point just to the right of their division. We have stripped the parietal peritoneum back until you see the inferior lateral wall of the bladder, and at this place, just about two inches from the bladder, I can distinctly feel the calculus in the ureter. With a small-bladed knife I am

Digitized by Google

making a longitudinal incision in the ureter, just over the stone. Notice that I am grasping the portion of the ureter containing the stone with my thumb and index-finger to steady it while the incision is made over it. If those of you in the front rows will stand up, you will be able to see the stone partly protruding from the slit in the ureter. With a pair of smooth forceps I am lifting the stone out, and here it is (Fig. 5). I will pass it around. Notice that it is longer than it is thick, corresponding to the shape of the ureter; observe, also, the sharp projecting points which make clear why passage of the stones is nearly always painful and why microscopic blood is customarily present in the sediment in such cases. Many of these cases give very definite histories of past attacks of hæmaturia.

I am now introducing interrupted stitches of plain catgut and closing the slit in the ureter. I take care that the stitches include only the muscularis and do not grasp the ureteral mucosa.

A cigarette drain is now placed down to the ureter that is extraperitoneal, and emerges at the lower end of the abdominal incision. I shall sew up the abdominal incision by suturing the anterior sheath of the rectus just as in closing the appendectomy incision. The skin is sutured with interrupted sutures of silkworm gut. This operation, as you have seen, has been entirely extraperitoneal, so that we shall not be disturbed if there is a leakage of urine from the wound for the next few days. In fact, it has been our experience that there is a drainage of urine from the wound for from four to seven days, after which it ceases and healing takes place. The drain will be removed upon the fourth day, for by then a canal will have been established along which any further urinary drainage can escape.

Though I have placed sutures in this ureter, I want to call your attention to the fact that it is unnecessary, and that rapid and complete healing of the wound would take place even if the ureteral wound were left widely open. This fact is true both in incisions of the ureter and in incisions of the common bile-duct, with the following two provisions; that no obstruction is present below the site of incision, and that the incision is exactly longitudinal.

There are other approaches for the removal of ureteral stones besides the one through the abdomen which you have just seen. For instance, I accomplished the removal of this large ureteral stone which you see in this X-ray (Fig. 6) by way of the vagina, an incision being

Digitized by Google

made beside the cervix, the ureter isolated to one side of the structure, the stone found, and removed through a slit in the ureter just as in this case.

This is less of an operation than the abdominal one which you have just seen, but has a greater likelihood of being complicated by a ureterovaginal fistula, inasmuch as gravity drainage flows rather through the slit in the ureter and into the vagina, while with the abdominal operation gravity drainage is along the course of the ureter into the bladder.

Occasionally stones become lodged in the ureteral orifice and must be removed by a transvesical operation, exposing the ureteral orifice so that the stone can be extracted from it. More often these stones can be extracted from the orifice by means of the cystoscope and either be washed out through that instrument or through a bladder evacuator in connection with a lithotrite.

This young girl will be kept in bed for ten days, and during the time that urine is escaping from the wound she will be kept upon full doses of urotropin to guard against the possibility of secondary kidney infection.

Digitized by Google

TWO LECTURES ON INJURIES TO THE CRANIUM AND BRAIN IN WARFARE *

BY CHARLES GREENE CUMSTON, B.S., M.D.
Privat-docent at the University of Geneva; Honorary Member of the Surgical Society of Belgium; Fellow of the Royal Society of Medicine of London, etc.,
Geneva, Switzerland

Lecture II

Gentlemen: Before commencing the subject of *treatment of wounds of the head from projectiles,* I will show you several temperature charts which illustrate the progress of cases that do well.

The first chart (see Chart IV) is that of a soldier who was brought to the ambulance about fifteen hours after the receipt of his injury. There were two small apertures, one in front of the ear, two centimetres above the zygoma, the other behind the ear, about at the level of the point of junction of the mastoid apophyses of the temporal and of the sphenoid. Other than a headache, there were no other symptoms.

Both wounds were enlarged under local anæsthesia. The anterior wound contained a small bit of shell embedded in the temporal muscle. The bone was intact. The posterior incision revealed an opening in the bone about the same size as that in the skin; that is to say, three to four millimetres in diameter. This was enlarged with bone-cutting forceps until it reached the diameter of about 20 millimetres.

The dura was then found to contain an opening about the same size as that in the bone, and, since it was in the exact situation of the lateral sinus in relation to the opening in the skull, the opening was not further enlarged. Some small clots and two or three splinters were removed. The projectile was not found.

There was some suppuration, but the wound was healthy and of a bright-red color, and cicatrization took place without any untoward symptoms.

The second chart that I show you (see Chart V) is that of a soldier, aged twenty-seven years, brought to the ambulance the morn-

* Concluded from Vol. IV, Series 27, page 120.

Digitized by Google

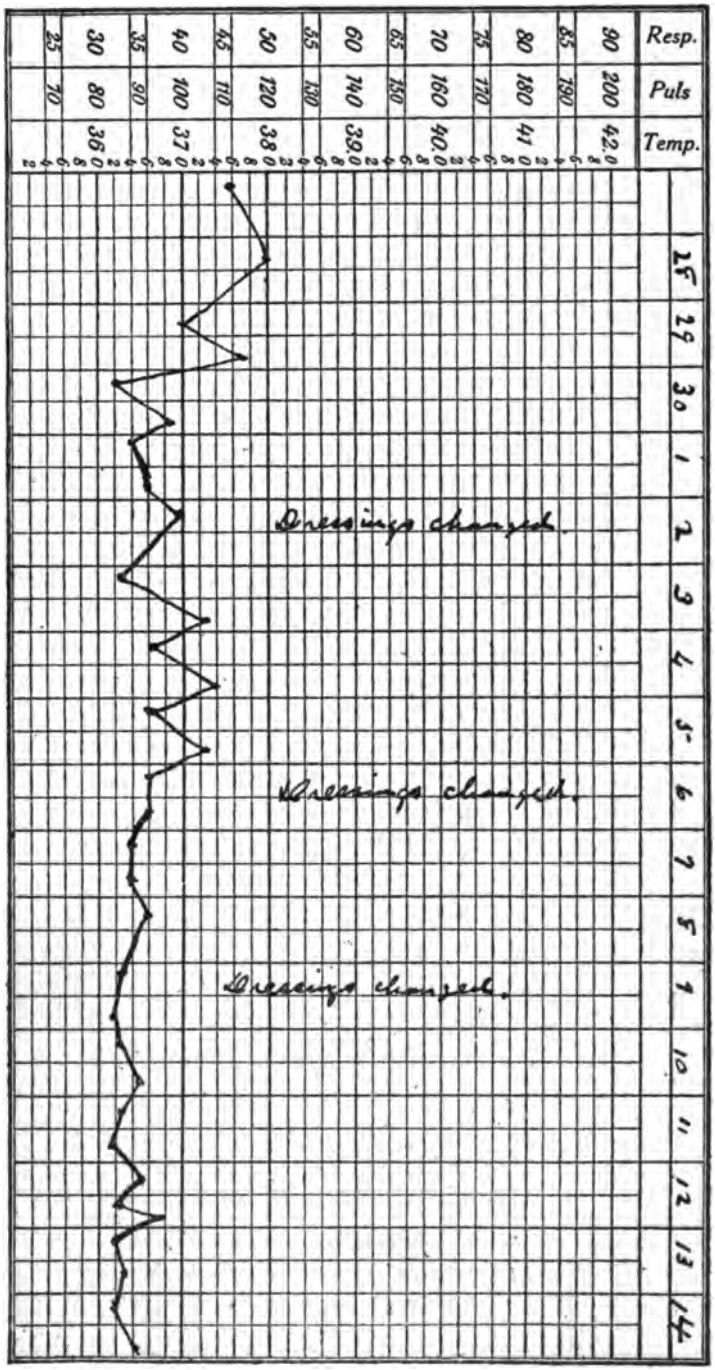
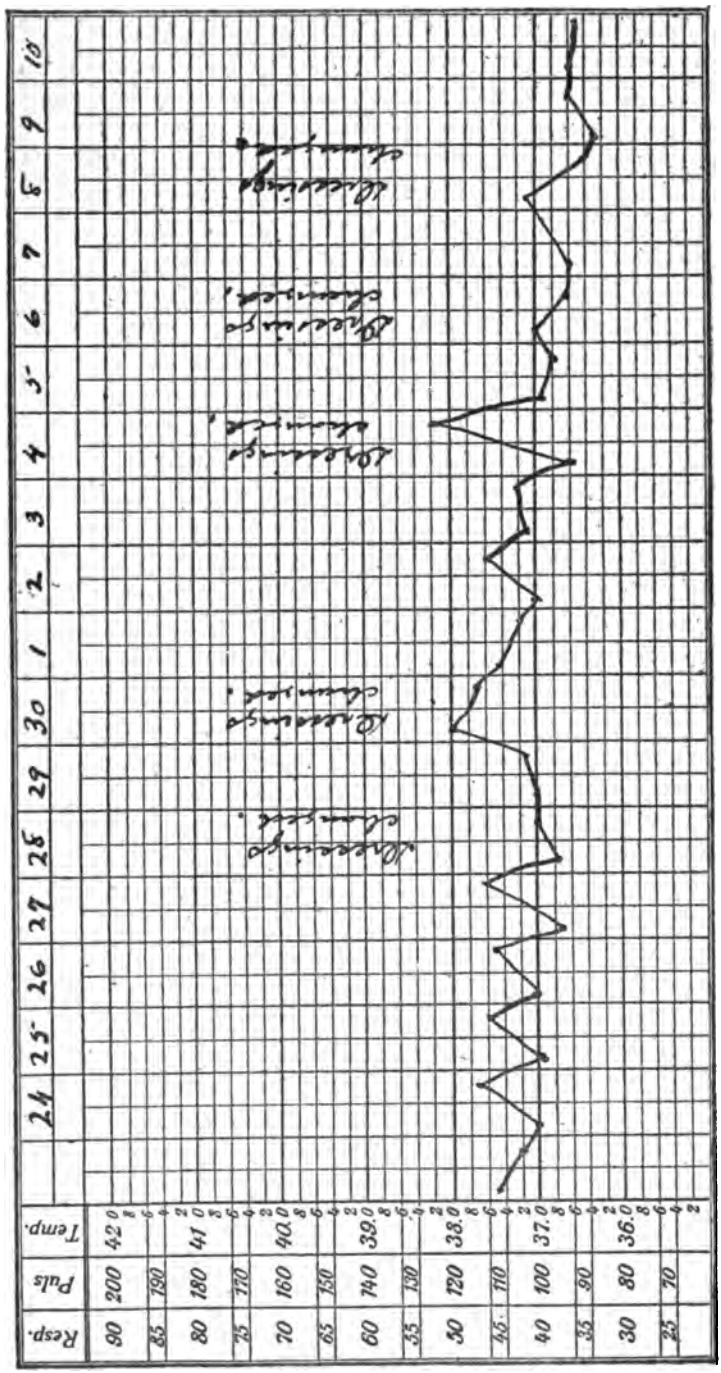


CHART IV

Digitized by Google

CHART V

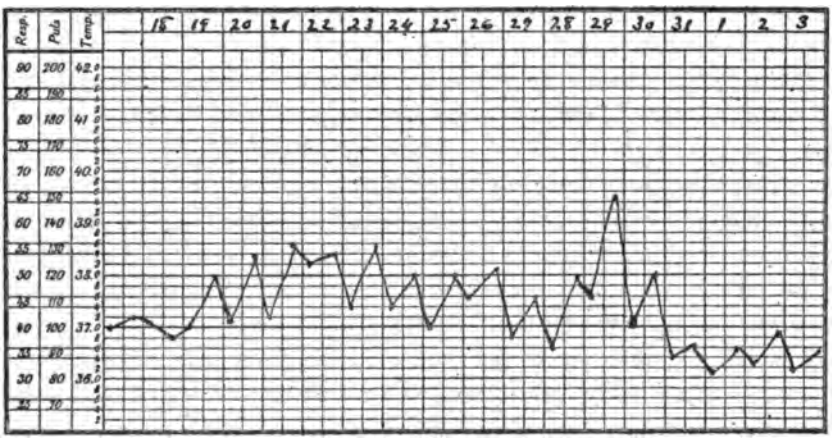


Digitized by Google

ing after receipt of injury at 6 P.M. There was a round aperture behind the left ear at the level of the upper third of the skull. There was headache, but no torpor, no sensory or motor disturbances.

On the following morning, under local anæsthesia, a crucial incision was made over the wound. A non-deformed shrapnel bullet was found lodged in a depression. Removal of splinters after slight enlargement of the opening in the external table to remove them with ease. This point was a little above and back of the base of the mastoid. The last remaining splinter was very small and had penetrated the lateral sinus, which began to bleed as soon as the spicule was removed.

CHART VI



A strip of gauze was pushed in with difficulty and the severe hemorrhage was overcome. Light gauze was packed under the edges of the opening in the skull in order to complete hæmostasis.

This was the only perforation found in the dura. The patient made a good recovery and was transferred to a base hospital 26 days later.

The next chart (see Chart VI) is that of a thirty-four-year-old subject who presented a bullet wound of the left temporal region. The patient could walk without assistance. He had only some disturbance of the memory. Many bone splinters on the dressing were removed.

The following day, under general anæsthesia, an opening, two

Digitized by Google

to three centimetres in diameter, was discovered in the temporal bone, through which some brain substance protruded. A long incision, carried from below upward and from left to right in the direction of the cranial wound, was made; the opening was increased to five or six centimetres in length by two to three in width, so that the aperture in the external table was made equal in size to that of the internal. Removal of bone splinters, irrigation with warm salt solution and rubber-tube drain.

As you see on the chart, there was, following a slow descent in lysis, a sudden rise in temperature, due to a large boil on the thigh, which was incised, after which recovery was uneventful.

This chart is that of a case of through-and-through bullet wound of the skull; the entrance wound was on the left of the lambda, while the exit wound was in the left parietal bone (see Chart VII). There was coma and contracture of the left upper and lower limbs and side of trunk. There was also protrusion of some mashed brain substance. Lumbar puncture withdrew a distinctly bloody liquid.

Next day, under general narcosis, an incision was made uniting both openings. There was a large loss of substance of both tables in the form of a gutter four to five centimetres long and 1.5 centimetres wide. From the upper border of the gutter and directed toward the median line ran two fissures, marking off a large movable splinter, but which was adherent to the dura. This splinter was elevated, and the other non-adherent splinters were removed. The dura was torn. The edges of the gutter were evened with bone-cutting forceps. Irrigation with hot normal salt solution. Partial suture of scalp incision.

Two days later the coma was less and the contraction of the limbs had subsided. Recovery uneventful; discharged to base hospital 19 days after operation.

Chart VIII, which I next show you, is that of a soldier, aged twenty-two years, who was operated on a few hours after the receipt of his injury. When brought to the ambulance there was a retardation of his mental processes, the patient replying to questions in monosyllables and very slowly. There was a long wound running anteroposteriorly over the left temporoparietal region.

Under general narcosis the wound was enlarged and an incision at the middle and perpendicular to the upper margin of the wound was made and carried toward the median line. A long anteroposterior

Digitized by Google

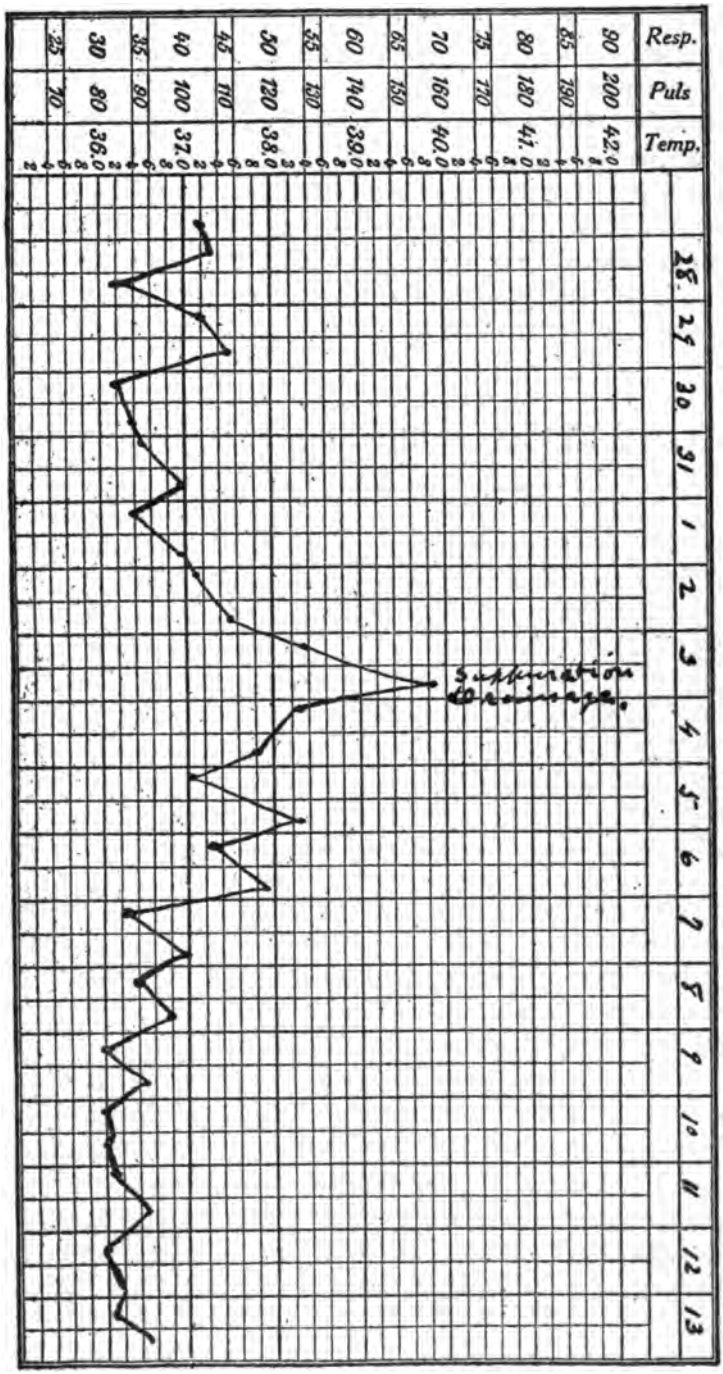


CHART VII

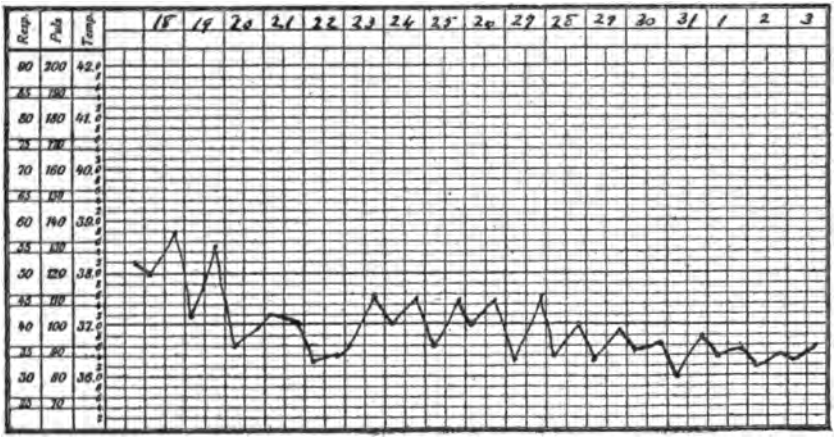
Digitized by Google

fissure was thus exposed to view and was found to run parallel to the zygomatic arch. As the patient had offered no evidence of cerebral compression or other symptoms of localization, nothing further was done but to carefully cleanse the wound. The scalp was sutured.

On the day following there was a rise in temperature and the patient had two epileptiform seizures, one at 9, the other at 11 A.M. The seizures began with convulsive movements of the face on the right side, which extended progressively to right limbs and then to the entire body. Stertor and cyanosis.

A second operation was at once performed at 2 P.M., under

CHART VIII



general narcosis. Removal of the sutures, free trephining with chisel in the middle of the fissure, and enlargement of this opening with bone-cutting forceps. An opening was made eight centimetres long by one in width. Removal of some bone splinters which had become detached from the internal table, as well as some clots. The dura was intact, but the brain did not pulsate. The dura, therefore, was incised in the axis of the opening made in the skull, and this gave issue to a large quantity of black blood and mashed cerebral substance. Drainage of the large focus and partial suture of the scalp.

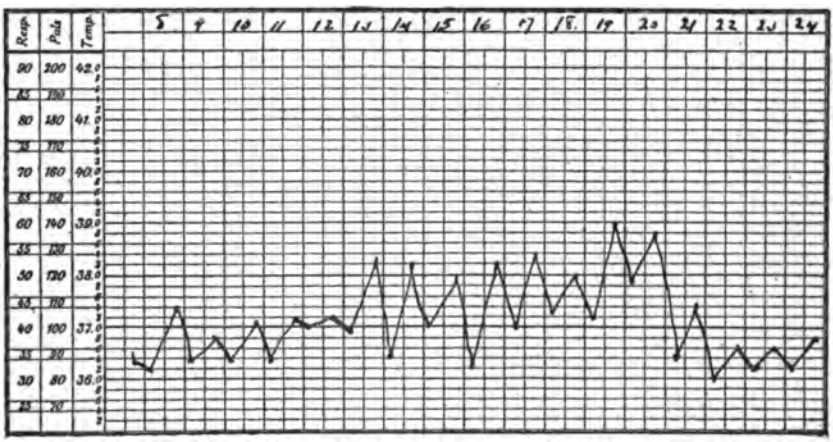
After the operation the seizures did not recur; convalescence was progressive, and the patient was transferred to a base hospital just one month later in excellent condition.

Digitized by Google

As you perceive, this chart varies from those already shown (see Chart IX). It is that of a subject, aged twenty-nine years, who was brought to the ambulance just one hour after receiving a wound in the interparietal region from an exploding shell.

A deep, V-shaped, contused wound, with the apex pointing forward, was found in the interparietal region. One of the branches of the V ran along the median line. The patient was in a state of torpor and did not reply to any question. Digital exploration revealed evidences of depression near the apex of the V-shaped wound, and a small bone splinter presented in it.

CHART IX



Operation under chloroform. Median incision extending along the median branch of the V toward the forehead. Two long perpendicular incisions were made at the middle of the first incision, thus transforming the whole into a crucial incision and freely exposing the focus of injury. A circular depression was revealed, about the size of a fifty-cent piece, seated almost exactly in the centre of the parietals. Removal of the depressed fragments of the external table.

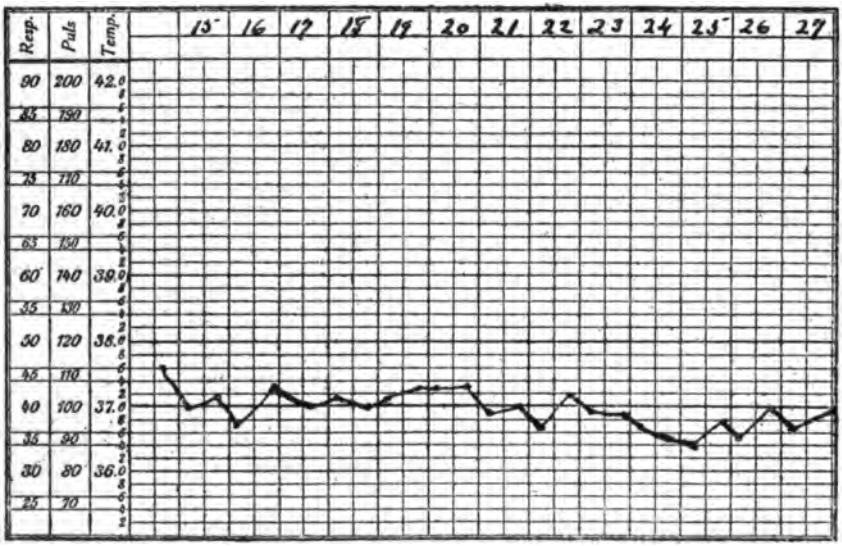
Over the internal table the depressed area was larger in extent. Movable bone splinters were removed and the external table was resected so as to correspond with the opening in the internal table, and then the edges of the cranial opening were rounded off. When this had been done the opening measured the size of a silver dollar, or even larger.

Digitized by Google

Two small rents in the dura were then revealed, but the longitudinal sinus was intact. Irrigation with hot salt solution. Gauze dressing. Recovery was simple and complete. The patient was seen six months later, at which time he was well, excepting that from time to time he experienced a little vertigo.

I am unable to account for the rise in temperature from the 14th to the 21st of the month, as indicated on the chart, because the patient was progressing nicely and there was no symptom of a commencement of meningeal infection.

CHART X



The last chart I will show (see Chart X) is that of a soldier, aged twenty-six years, who sustained a bullet wound in the median line slightly in front of the lambda. At the bottom of the wound a bit of metal, deeply embedded in the bone, could be seen, but it was impossible to extract. The patient was perfectly sound mentally and could, when steadied, get into his bed alone. He complained only of a rather severe headache.

Operation was immediately done under general narcosis. A longitudinal incision was made in the area of the wound and the projectile was removed from the bone. The projectile proved to be the tip of a German bullet, consisting of its mantle and lead; a portion of

Digitized by Google

the mantle was twisted like a corkscrew, which explained the difficulty of its extraction.

The removal of the projectile left a small aperture in the bone involving the entire thickness of the skull, so that it was considered advisable to enlarge it to the diameter of two to three centimetres. By this means a much more extensive depression of the internal table was revealed. The splinters of the latter had torn the dura in which they were fixed. The opening was still further enlarged in order to proceed with the easy extraction of these splinters, whose situation made it probable that they might involve the sinus, and, in fact, when one bone spicule was removed a severe hemorrhage followed.

The opening was plugged with gauze pushed down in the direction of the sinus. The hemorrhage ceased and the wound in the scalp was sutured, excepting for the points at which the drainage gauze passed out.

The patient made an uneventful recovery, and thirteen days later was transferred to the rear.

From these briefly reported case-histories you will have already foreseen what the proper treatment of head injuries from projectiles of war should be, but, nevertheless, I propose to enter into this subject in some detail, because, in reality, the question is a vast one and should be thoroughly understood.

In the first place, I will say a few words about the *preventive means* taken to insure against injuries to the head in warfare. The introduction of the metal helmet has reduced wounds from projectiles about 33 per cent., according to statistics that I have received. The helmet seems to act in two ways: (1) Its resistance absorbs a portion of the force from the velocity, and many are the instances where the scalp has been merely scratched by the missile which had perforated the helmet. (2) The curve given to the helmet has a tendency to cause a tangent deviation of the projectile, whose direction is not normal to the point hit. This result appears to be quite as important as the first, and a comparative examination of the entrance aperture in the helmet and the head wound proves this to be true.

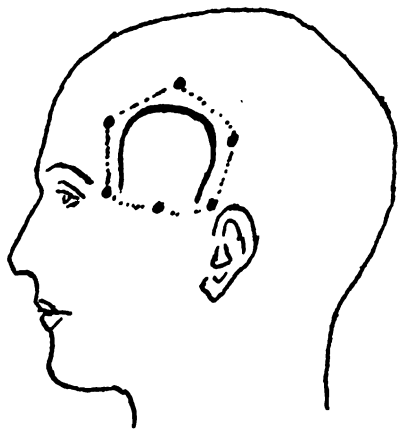
When considering the preventive action of the helmet, we should also consider the condition in which the soldier's head is kept. Long hair is a great element of danger, and is probably the principal factor of infection in cranial wounds, because it brings with it quite as

Digitized by Google

many, if not more, infecting substances as the projectile itself. My reasons for this statement are clear and need no further comment. Therefore the hair should be clipped short at intervals of not less than a fortnight.

Now let us consider *penetrating wounds of the skull.* The principle of *immediate* treatment is understood and admitted by all. An operation is necessary and should be undertaken as soon as circumstances will permit. Time is just as much an essential factor in the case of the meninges as it is with the peritoneum, and the ultimate result to be aimed at is to place the traumatic focus in such a condition that the wound will follow an aseptic evolution. This implies

Fig. 1



a large incision over the area of injury, evening off of the opening in the skull, removal of bone spiculæ, and proper drainage.

The scalp should be shaved completely, as this makes the process of cleansing easier. Soap, water, tincture of iodine, and alcohol are necessary. Ether, for removing fat and dirt, should be used, and if the stock of ether is low a good substitute is automobile essence.

General narcosis is not necessary if the patient is in deep torpor or coma, otherwise local or regional anæsthesia or general narcosis is necessary. It is not necessary for me to refer to the advantages of local or regional anæsthesia, each having its own indications, according to the extent of the proposed interference, and the selection of one or the other will rest on the judgment of the surgeon. This anæsthesia offers all necessary conditions for direct interference on the

Digitized by Google

skull or brain. You should make your injections as in this figure (see Fig. 1), which I show as an illustration of the technic. The dots show the points of insertion of the needle, the dotted lines representing the lines of infiltration of the anæsthetic. A good solution is a 1 to 200 solution of novocaine in normal salt solution, to which 25 drops of a 1 to 1000 solution of adrenalin have been added to each 100 Cc.

However, I personally prefer the following formula:

℞

Novocain. hydrochlor. ..... 2 grammes
Sodii bicarb. ..... 1.2 grammes
Aq. dest. .....ad. 100 Cc.

The addition of the soda salt increases the anæsthetic potential of the alkaloid five times; therefore much less of the solution need be used.

The question of the best manner of access to the skull wound and of the brain, if one exists, is a somewhat mooted question. Which gives the larger operative field—a horseshoe shaped or crucial flap? The first certainly exposes the lesion well, and consequently complete and relatively quick work, and when put back it makes an efficient protection to the underlying operative area.

When the entrance wound is small and apparently not much, if any, infected, the horseshoe flap seems to be the most advantageous. If the wound heals *per primam,* the patient can usually be discharged in a fortnight. But I would add that such cases are always bullet wounds.

Wounds by projectiles used in the present war rarely realize these ideal conditions, and infection is almost certain, while the damage done to bone and brain, when penetration into the skull occurs, is ordinarily considerable. Therefore to replace a flap and suture it, even when supposedly thorough cleansing of the wound has been done and drainage established, is a procedure that I do not advise you to adopt, as you will certainly see the case go septic, with all that that implies.

For many reasons a straight incision is the best. By dissecting off the scalp on each side you obtain a large operative field and you are also able to freshen the ragged edges, leaving a clean opening in

Digitized by Google

the scalp. Besides, if the incision is not found large enough it has only to be lengthened, and with a pair of good retractors your work will be easy. The after-care is easier, because a flat dressing can be applied and the wound is more easily watched.

In some cases a crucial incision can be made, as in some of the cases reported to you in my last lecture, and gives a good exposure of the focus of injury. Here again the selection will depend upon the judgment of the surgeon.

As to the aperture in the skull, I would say that you must not enlarge it too extensively, and the bone spiculæ which are still adherent should not be removed. On the other hand, if the opening in the skull is too small it offers many dangers. In the first place, a proper cleansing of the cerebral focus can not be made through a small opening, and proper drainage is likewise out of the question, because if a hernia of the brain occurs it will completely occlude any exit to the secretions. Therefore the opening in the skull must be sufficiently large for all surgical requirements, and the danger, after cicatrization has taken place, of a too freely removed area of bone is as nothing compared to the immediate risks of a generalization of a meningeal infection.

As to the focus of injury in the brain itself, you must open up the aperture in the dura to the same extent as the opening in the skull. All brain substance presenting should be delicately removed, likewise blood-clot, until the opening is unobstructed. Intracranial tension will help in this, but only a blunt spoon should be employed for clearing up this traumatic cerebral focus.

If we could be perfectly sure of being able to follow the track of the projectile in the brain without going out beyond it into healthy brain substance and without increasing the intensity of the disorders already existing, without opening into the ventricles and without propagating infection, exploration of the bottom of the track would clearly be of the greatest utility. But there is always danger of creating greater trouble, so that you should be extremely prudent, and I believe that it is wiser to discard all attempts at deep exploration. I am, of course, speaking only of brain surgery at the front, not in a base hospital at the rear.

As to searching for and attempting the extraction of the missile, the proper conduct would be to remove it; but here again you will

Digitized by Google

meet with many difficulties, not to say impossibilities, so that I fancy the present general opinion is to desist from all such manœuvres. At least, that is my advice to you, with, of course, exception to certain special cases which offer no fixed rules for treatment and regardless of the late accidents inherent to the inclusion of the projectile or projectiles in the brain.

The cerebral traumatism may be irrigated gently with tepid normal salt solution on the surface, but I do not advise irrigating in the depths of the wound, for fear of spreading infection. And then an irrigation must be looked upon as a traumatic agent to the delicate brain structures and consequently should be avoided.

On general principles, the use of drainage is admitted by all surgeons who have had experience in cerebral surgery during this war—and who has not? We are dealing with a combination of altered nerve tissue, foreign bodies of every conceivable kind, and more or less septic cerebrospinal fluid, which must be little by little eliminated. Therefore it would at first sight seem that proper drainage represents a perfect way of removing all these nefarious products, and, *a priori,* is most seductive.

But, gentlemen, in practice it is not ideal. No matter how soft and smooth the rubber tube, it can not be denied that it acts as a traumatizing body in respect to brain-tissue, and what is of the highest importance is that it is prone to open into a ventricle! The tube readily becomes occluded with the brain-substance, which is reduced to a paste from the injury, and, when all is said and done, the tube acts as an ordinary foreign body.

As to gauze, it is better as a hæmostatic than as drainage material, because it acts far more as a plug than as a filter. Therefore, when we come to the consideration of actual practice, it is evident that the best means of obtaining proper drainage is to open the skull and dura sufficiently and then apply a flat dressing, by which means the intracranial hypertension will take care of the spontaneous elimination of débris and septic fluids, on the condition that the opening made is sufficiently large and that careful and constant watching the wound is not neglected. I think that by carrying out this plan one realizes the least nefarious conditions and, at the same time, the most efficacious means of drainage of the septic focus.

When the surgical interference is completed (that is to say, direct

Digitized by Google

treatment of the cranial and cerebral traumatic foci), the scalp incision may be partially closed with sutures. Then apply your flat gauze dressings and roller bandage. Change of dressings should be as *infrequent* as possible, and the gauze in direct contact with the wound should not be touched. At each change of the superficial gauze the underlying layer can be moistened with some iodized alcohol, and thus it may be left undisturbed for two or three weeks, or even more, on the condition, of course, that the wound undergoes a normal evolution and that no indicative symptom of retention arises.

A rise in temperature, the presence of Kernig's sign, headache, or bradycardia is the indication that things are going wrong, and if, after a thorough emptying of the intestines, this symptom-complex still persists, and all the more so if it becomes aggravated, you should explore the traumatic focus without delay. As to the manner of dealing with it, I shall refer to it when speaking of the complications. I have considered, so far, only the question of loss of substance in the skull with a focus of cerebral attrition, and it now remains for me to consider depressed fractures and fissures, after which I shall refer briefly to simple denudation of the skull without any apparent evidence of a deeper bone lesion.

The classical line of *treatment in depressed fracture of the skull* is immediate interference, raising the fragments, and removal of detached spiculæ of bone. Such a technic is still applicable in war surgery, with one great addition, and that is the treatment of the subdural focus of contusion, and to which I shall revert.

As to *fissures of the skull,* they require immediate operation, because of the constant lesions present in the internal table and the frequent involvement of the dura. The favorable statistics of the non-interventionists are not sufficiently convincing and by no means tempt one to abstain. Make a hole with a drill or a small trephine opening in the middle or at the end of the fissure, sufficiently large to insert a bone-cutting forceps, so that the underlying focus can be properly exposed to view. The exposure of the open fracture, which is a fissure, is the best means to prevent deep-seated septic complications, to which it will certainly give rise if not dealt with surgically. If the necessary instruments are wanting, or if the surroundings in which one operates are septic, it is better not to interfere until some distinct indication calls for operation, such as signs of compression or

Digitized by Google

an increase in one of the elements composing the meningeal symptom-complex.

When such circumstances exist, you should make a free incision in the scalp and thoroughly expose the line of fracture and then proceed to give as careful a cleansing of the traumatic focus as possible, after which a flat iodized alcohol dressing is applied. Usually such a procedure is crowned with success, and a secondary interference will rarely be required.

You must not infer, from what I have said, that preventive trephining in cases of fissure without immediate signs of compression or hemorrhage is useless, but, under similar circumstances, a methodical treatment of the soft structures involved in the injury is an absolute necessity and is often in itself enough to prevent the development of deep-seated septic complications. Remember that the all-important point, which should be your guiding-star in treating these cases, is the presence of infection of the scalp produced by the projectile.

No matter what measures may be employed for cleansing the scalp and superficial wound, they will not make the parts aseptic, so that you will always be operating in a septic focus and this is what makes an opening in the dura such a serious matter, because this membrane is the natural barrier to the progress of infection toward the subarachnoid spaces. When a traumatic aperture has been made in the dura it should be enlarged and utilized for the evacuation of the underlying focus of contusion.

But the dura may be intact, and this is a point of highest importance in directing our treatment. When the dura is not involved in the injury, to incise it would be the highest point of rashness and is only to be countenanced by distinct indications. Absence of pulsation in the area exposed is, in my opinion, not an indication, while signs of hemorrhage, cortical irritation, or suppuration, are decided indications for incising the dura. Also, when in doubt, lumbar puncture may be resorted to, and the leucocytic formula will be diagnostic in the case of infection, but a negative result should not deter you from operating.

I shall now direct your attention to the *complication of head injuries in warfare,* these being hemorrhage, meningo-encephalitis, cerebral hernia, and escape of the cerebrospinal fluid, all of them being contemporary with the evolution of the injury. Little need be said

Digitized by Google

as to the treatment of *hemorrhage,* as it can only be controlled by ligature of the bleeding vessels, those of the dura or brain. When a sinus is the cause of the bleeding, gauze plugging is the best; the packing can be left *in situ* for three or four weeks without any trouble.

The treatment of *meningo-encephalitis* is the most mooted question of head injuries of war. To begin with, let me remind you that the septic process is a secondary one, and before becoming generalized it remains a local infection for some little time, and it is precisely during this period that it should be dealt with. Therefore you should watch your patient carefully for the very first evidence of the trouble, following the progress of signs of meningeal reaction, and without waiting for the eclosion of all the symptoms you should open up and explore the traumatic focus without delay and act upon the indications it reveals.

There are two essential sites of infections, viz., the subarachnoid and intracerebral. These may evolute together at the same time or singly. Occasionally, when the site of the infection is discovered by an attentive and methodical examination of the meningeal and brain surfaces through a sufficiently large opening made in the skull, the outcome will be satisfactory. The point of exit of pus when this exists is an excellent guide for reaching the purulent focus, but unfortunately this condition does not always exist, and then only a methodical examination will reveal the location of the purulent collection.

Generally speaking, a cerebral hernia is present in these cases, at least in its early stage, and it is around its base that you should commence by gently separating it from the border of the opening in the skull. This should be done over its entire circumference.

If a subarachnoid focus of suppuration under tension is present under the opening in the skull you will hardly ever fail to discover it and empty it, after which the opening in the skull can be enlarged if the importance of the septic lesion should require it. Oftentimes small subdural foci of pus will be discovered only by enlarging the trephine opening, and you need never hesitate to do this if you have good reason to suspect pus.

But when a methodical examination of the intracranial structures exposed by the skull opening does not reveal a meningeal localization it is clear that the symptoms are due to suppuration of the focus of

Digitized by Google

cerebral attrition, which then must be exposed. To do this you must remember that this focus communicates quite freely with the exterior, and that the track made by the missile and bone spiculæ is rarely closed. Therefore it is this track that must be opened up in order to reach the focus—a much surer and less dangerous procedure than exploring with an aspirating needle. Usually, the focus is not deeply seated, if you take into consideration the height of the hernia.

The hernia should be catheterized, if you will allow me this expression, until the pus focus is reached. A depressible umbilicated point will be seen on the surface of the hernia, and it is here that your instrument should be introduced. It should be passed with the greatest precaution in the suspected direction of the track, using for this purpose a soft rubber catheter.

In obscure cases, where the initial localization of the pus is difficult to detect, as in instances of multiple foci, and considering the great gravity of these cases, I see no reason why the skull should not be freely opened, likewise the dura, in order to produce decompression and also to give exit to the cerebromeningeal products of suppuration.

The starting-point of a late development, weeks or months after the receipt of the injury, of a focus of suppuration is not infrequently the embedded projectile, it having reached quite a distance from its entrance-point, so that the first part of the track closes without any septic process occurring in it. A diagnosis under these circumstances can be made only by radiography, which will locate the site of the projectile and at the same time guide the surgeon in the operation for its removal.

Intraspinal injections of collargol or electragol have been resorted to by several surgeons of repute for the treatment of intracerebral sepsis, but the results are rather too uncertain for any opinion to be as yet expressed in regard to this method.

Late cerebral suppurative processes arising after complete cicatrization of the wound are to be treated like any case of cerebral abscess, only the site of the original injury is a guide to localization of the greatest importance.

Now what is to be done with *hernia of the brain?* It may be contemporary with serious septic accidents or, on the other hand, it may remain after these have cleared up. In the first case it will become eliminated by a process of necrobiosis, but if it persists one

Digitized by Google

has the choice of two methods, viz., either to resect it with a knife or with a thermocautery, which will facilitate drainage, which it prevents, but it at the same time deprives the patient of just so much cerebral substance that it is better to allow to remain. Or, on the other hand, simply enlarge the opening in the skull in order to relieve the strangulation at the base of the hernia, and this is the only method that I can conscientiously recommend you to follow.

When the hernia persists after recovery from the septic complications, compression or resection of the hernial mass may be tried. But here again resection seems to me a useless mutilation, and compression, if the skull opening has been properly enlarged, will usually result in reduction of the mass, and, as the intracerebral hypertension subsides at the same time as the septic process to which it is due, reduction of the hernia becomes easier. Lumbar puncture, repeated as often as may be indicated, may be resorted to and is unquestionably a great help in reducing the mass.

Of course, to all surgical treatment you must combine with it the medical, of which I will say a few words. The free use of hypodermic injections of camphorated oil (as much as 10 Cc. in 24 hours if necessary), ether, sparteine, and caffeine is indicated, with horizontal position in bed, and Murphy's proctoclysis, as in all cases of serious surgical shock.

Cases of head injury should be placed in a quiet room or ward, in semi-darkness, and all cause of emotion or suffering should be scrupulously avoided. These cases must never be transferred to another hospital until the lapse of four or five weeks, and two months is even better when this is possible, as travelling soon after a brain operation will surely end in disaster, as has been amply proved in the early part of the war.

Of the late effects of brain and skull injuries I shall not speak, as my purpose in these lectures is to instruct you what to do in ambulance practice only, and when these head injuries are treated soon after their receipt at the front, after the manner I have described to you, their ultimate outcome will be so satisfactory in general that the surgeons and neurologists at the base hospitals will meet with fewer cases of late-appearing manifestations than has been the case.

Digitized by Google

Medicine

CLINICAL MANIFESTATIONS OF THE VARIOUS JOINT AFFECTIONS AND THEIR BEARING ON DIAGNOSIS

BY PHILIP KING BROWN, M.D.

San Francisco

THOUGH much light has been shed in the last five years on the bacterial origin of joint affections, we are by no means on established ground when we seek to classify them according to etiology, except in the few pyæmic joint complications of generalized infections, in erysipelas, pneumonia, typhoid, epidemic meningitis, gonorrhœa, tuberculosis, coccidioidal granuloma, syphilis, etc. Nor is an etiological factor of bacterial origin proved in certain groups of joint infection, plain as the growing evidence makes such origin probable. For example, some of the manifestations of gout seem, as in articular rheumatism, to point to bacterial action in connection with the characteristic metabolic changes. McCrae's studies of Osler's 350 cases of arthritis deformans yielded negative cultural results, so far as that form of investigation was pursued, although Still's type of acute arthritis deformans in young people, preceded by enlarged and inflamed tonsils and accompanied by low fever, enlarged spleen and lymph-nodes, suggests clearly a bacterial origin. No definite corroborative proof of this origin has been established, although Osler records the benefit of streptococcus serum. Pemberton's recent studies of 47 cases in relation to improvement from long-continued diet low in carbohydrates and high in fats seem to show a concurrent metabolic influence in such joint disturbances, although proving nothing as to etiology.

There is not a pyogenic organism that has not been recovered in pure culture from infected joints, and there is little doubt that the joints are the most favorable to infection of all the serous membranes.

NOTE.—The X-ray illustrations are chiefly from the author's private cases and the selected cases of the St. Francis Hospital X-ray Department, M. P. Burnham, M.D., Director.

Digitized by Google

When one considers that the heart valves are the site of active infection in only one-quarter of the cases of primary acute rheumatism, and in only one-eighth to one-twelfth of the recurrent cases; that acute infectious diseases have joint complications far more frequently than complications in any other part of the body; that secondary involvement in general seems to bear a direct relation to wear and tear, the organs and parts having the most to stand becoming most frequently involved in bacterial invasion, it is not difficult to understand the reason for the relative frequency of the involvement of the joints of the hands, feet, and knees, and to believe in the possible bacterial origin of it all.

However, since we cannot prove the case universally for bacteria, our next differentiation must be along the lines of other clinical manifestations.

A summary of the diseases which have joint complications is presented, together with the other symptoms which these diseases have in common. This will serve to illustrate the confusion in diagnosis of the underlying trouble, as well, perhaps, as to help clear up the difficulty.

It will be observed at once from Table I that joint complications of any unusual character must be subject to a most careful investigation as to their possible relation to systemic disease, and not until *every source* of possible infection is traced out and eliminated can one rest secure in the feeling that treatment is unavailing. Not alone the present foci must be sought out, but the possibility must be entertained of such foci being responsible for other remote conditions than the joint disease which, in turn, when stirred into activity, may cause the joint manifestations. An example of this is a woman whose joint disease had been growing by incapacitating for several years, rendering her relatively inactive and causing a gain of forty pounds in weight, and in whom intestinal disturbances were annoying. Her diseased tonsils and two teeth showing alveolar abscesses were removed with striking benefit. She was reduced the forty pounds by diet with further benefit, but gall-bladder attacks, accompanied by exacerbations in her joint disease, have occasionally followed in the last year. So definite has been this association that there can be but little doubt of the connection between joint pain and the infected gall-bladder. Comment on the infrequency of gonorrhœal joints in women with pus-tubes, as compared to such joints in chronic infection in the male

Digitized by Google

TABLE I

Table of Complications Found in Diseases with Acute Joint Manifestations

Diseases with acute symptoms in	Joints	Serous membranes and contiguous tissues				Nervous system			Eyes.		Skin.	Due possibly to throat infection
		Endo-, peri-, and myo-cardium	Pleura, lungs	Men-inges	Perito-neum	Delirium, coma, hyper-pyrexia, convul-sions	Neuritis	Chorea	Iritis	Con-junctivitis, etc.	Ery-thema, purpura, etc.	
Acute articular rheumatism	+	+	+	+	+	+	+	+	+	+	+	+
Septicæmia, etc.[1]	+	+	+	+	+	+	+	?	0	0	+	+
Gonorrhœa	+	+	+	+	+	+	0	?	+	+	0	0
Scarlet fever	+	+	+	+	+	+	+	?	+	+	+	+
Other infectious diseases[2]	+	+	+	+	+	+	+	0	+	+	+	+
Acute arthritis deformans	+	+	0	0	0	0	+	0	0	0	+	+
Erythema group[3]	+	+	+	+	+	+	0	0	0	0	+	+
Syphilis	+	+	+	+	+	+	+	0	+	+	+	+
Tuberculosis	+	+	+	+	+	+	0	0	+	+	+	+
Osteomyelitis	+	+	+	+	+	+	+	0	0	0	+	0
Gout	+	0	0	0	0	0	+	0	+	+	+	0
Scurvy	+	0	0	0	0	+	0	0	0	0	+	0
Hæmophilia	+	0	0	0	0	+	0	0	0	0	+	0
Spinal cord diseases[4]	+	0	0	0	0	0	0	0	0	0	+	0
Lead poisoning	+	0	0	0	0	+	+	0	0	0	0	0

[1] Including pyæmia, puerperal fever, acute arthritis of infants.

[2] Including typhoid, smallpox, epidemic meningitis, dengue, measles, pneumonia, influenza, dysentery, etc.

[3] Including arthritis as it occurs in the erythema group of skin lesions (Osler: Amer. Jour. Med. Sciences, January, 1904), intermittent hydrarthrosis (Wiesinger: *Deutsche med. Wochschr.*, August 27, 1903); polyarthritis with psoriasis (Adrian: *Mitth. a. d. Grenzgeb. d. Med. u. Chir.*, vol. xi, No. 2); Schönlein's purpura, etc.

[4] Including tabes, acute myelitis, and syringomyelia.

—From an article on acute joint disease by the author.

Digitized by Google

genito-urinary tract, may suggest itself, but the discharge from tubes into the uterus or peritoneal cavity and the consequent acute trouble have been frequently followed by joint manifestations. The author has seen a case in which joint disturbances were attributed to infection of intestinal origin, where both gall-bladder and appendix were removed for good cause, but without benefit to the joints, only to have it shown later that extensive alveolar abscesses underlay the whole trouble. The cry for removal of tonsils and teeth is often warranted, but by no means should one stake everything on what such procedures may be expected to accomplish.

Perhaps the best cause for the bacterial origin of joint disease has been made out by Billings, whose clinical use and interpretation of the work done by Poynton and Paine, Rosenow, Davis, Park, and a host of others have done more to call attention to the relation of focal infection to numerous acute processes than any work thus far. Not alone joints, but thyroid disease, ulcer of the gastro-intestinal tract, cholecystitis, appendicitis, skin disorders, and numerous other conditions have been traced to foci of infection chiefly in tonsils and teeth. F. A. Packard was one of the early clinicians in this country to recognize this relation of focal infection to systemic disease. The tonsils' relation to rheumatism, however, was pointed out by the French decades ago.

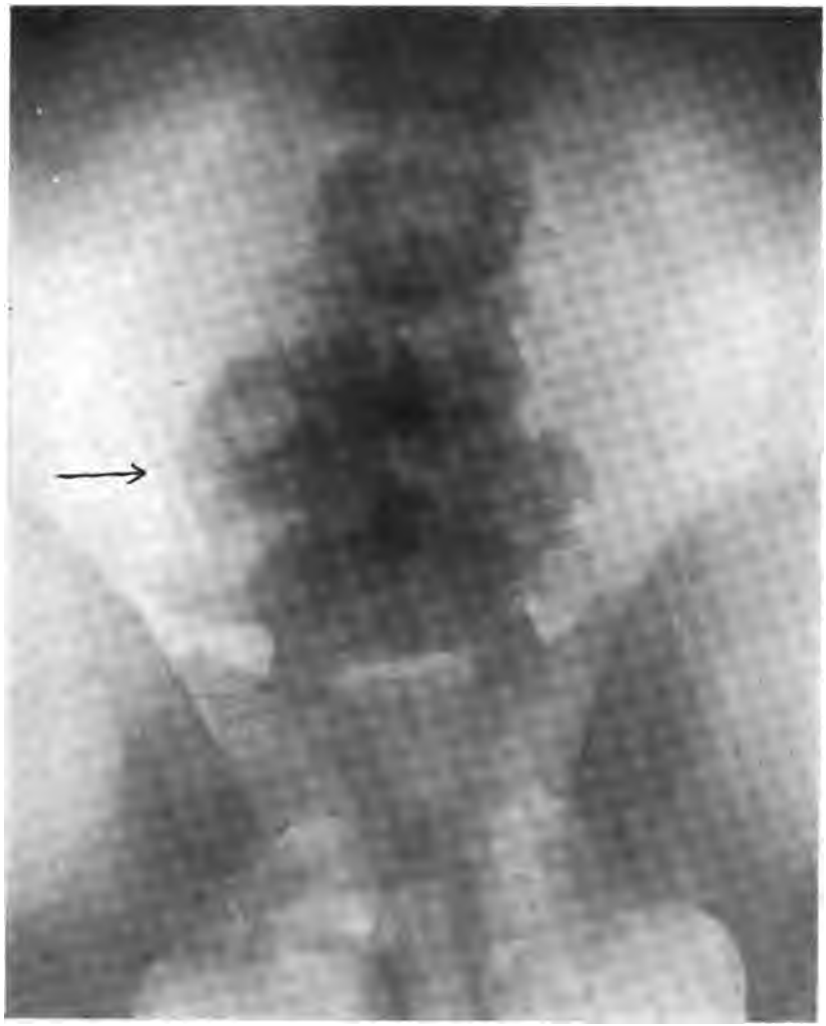
In addition to the systemic manifestations of infection and poisoning enumerated in the table there are joint complications of disease not strictly coming under either category. Hemorrhage into a joint, commonly the result of injury, may also be a complication of some neuropathic condition, or occur in hemorrhagic diatheses. Charcot quotes Riedel's [1] cases of severe joint destruction following, a few days after nervous lesions without demonstrable injury. Charcot has described these cases as due to loss of trophic impulses from the cord. Eloesser's recent report of his production of Charcot joints in animals by destroying the posterior columns of the spinal cord and then injuring joints below with the thermal cautery corroborates this fact. Figure 1 shows a rapidly developing Charcot joint in the spine in an advanced case of tabes. The case was observed by Dr. W. H. Campbell, who furnished the illustration, and who will later report the case in full.

Infantile scurvy presents as its essential lesions a subperiosteal

[1] Riedel, *Deut. Gesellsch. für Chir.*, 1883, p. 93.

Digitized by Google

Fig. 1



Charcot joint in spine.

Digitized by Google

Fig. 2

Exostoses on spine. Patient eighty-four. Acute osteo-arthritis of hands at eighteen.

Digitized by Google

hemorrhage, often near the epiphyses, but not into joints. The clinical picture of scurvy in the adult includes hemorrhage in more general distribution, and in addition there is occasionally acute arthritis with exacerbation of fever as a complication.

In connection with joint conditions generally in people over fifty years, recurring hemorrhages in the form of hæmoptysis have been called attention to by Sir Andrew Clark and French writers. Such hemorrhages are accompanied by no pulmonary pathology and are rarely severe.

The whole erythema group presents a combination of vascular change and joint symptoms. Arthritic purpuras, 30 per cent. of which have histories of definite rheumatism, are generally subdivided into three groups: purpura simplex with slight, if any, joint disturbance, but no other symptoms. Purpura rheumatica (Schönlein's disease) presents a more serious and diffuse joint disturbance and a wide range of erythematous manifestations, often several forms of erythema being present at once, besides the purpuric eruption. Osler has presented the extraordinary visceral manifestations of this condition in a series of four papers published twelve years ago. Any complication of acute infection, endo- and peri-carditis, meningitis, nephritis, etc., may show itself in this condition—most of them very like the streptococcus complications of true rheumatism. Christian has recently added to the literature a profitable study from the Peter Bent Brigham Hospital. Of purpura hemorrhagica (Werlhof's disease), the third arthritic purpura, there is little to say, except that it differs from the purpura simplex in extent and size of the subcutaneous mucous and submucous and even serous hemorrhages, and in the general severity of the disease, death being reported in as short a period as 24 hours.

Arthritis has been reported in Raynaud's disease, the involved joints being included in the varying ischæmic and passively hyperæmic parts. Which condition contributes to the arthritis is not known.

Another point of view presents itself in a study of classification of joint disease by X-ray findings, which give us a measure of two conditions occurring in joints—proliferation and destruction with atrophy. This invaluable clinical help has enabled us to make with certainty some diagnoses which were previously impossible. The painful spur on the heel in gonorrhœa can be made out in no other

Digitized by Google

way. Early changes in the knee and hip-joints in chronic arthritis are made plain. Perhaps one of the chief aids of the X-ray has been the upsetting of Goldthwaite's fallacy of sacro-iliac slip. A large series of cases in the Southern Pacific Hospital with distinct and characteristic symptoms of sacro-iliac joint pain have been X-rayed with no evidence whatever of slip. More than this, the surgeons have taken chronic cases with marked symptoms and with a heavy worsted hitch over the iliac bone have increased the pull on the affected side with the patient under ether, and still X-rays showed no slip. While such cases are relieved with pressure over the sacral part of the pelvis (applied with straps around the body), and even cured, there is no proof that the relief comes from preventing an actual slip.

The X-ray classification, taken with the pathology of the various joint disturbances which it so well illustrates, seems to give the clearest idea of the nature of permanent joint changes. The accompanying chart (II), adapted from "Adami's Pathology," will make this clear.

Examples of thickened capsule and fibrillated cartilage are not hard to find but reproduce poorly in X-ray illustrations. The knee-joints in heavy people with and without the problem of infection show these changes, and the painful grating knees are well-known bugbears to physicians.

Gout must be suspected in acute processes at the base of the big toe and careful investigation will show the relation of these attacks to infections. A physician, 60 years old, with chronic bronchitis developed a sore throat and 24 hours later typical gout in right big toe, the only attack he had ever had. Trauma may influence the distribution of gout as in another case where a patient recovering from gout in the left big toe, a recurrent attack, had the outer four toes of his right foot run over by a light automobile. He had severe pain that night and typical gout in *all* the toes of the injured foot, including the right big toe, which was not injured.

Luetic joints take on strange forms and may be productive, as they are most commonly, or rarefying. Fig. 3 shows a painful knee, regarded as tuberculous till X-ray and salvarsan cured it. The extraordinary ramification (Fig. 4) of the skull in another syphilitic, shows that hyperplastic conditions must not always be expected in syphilis.

Digitized by Google

Fig. 3

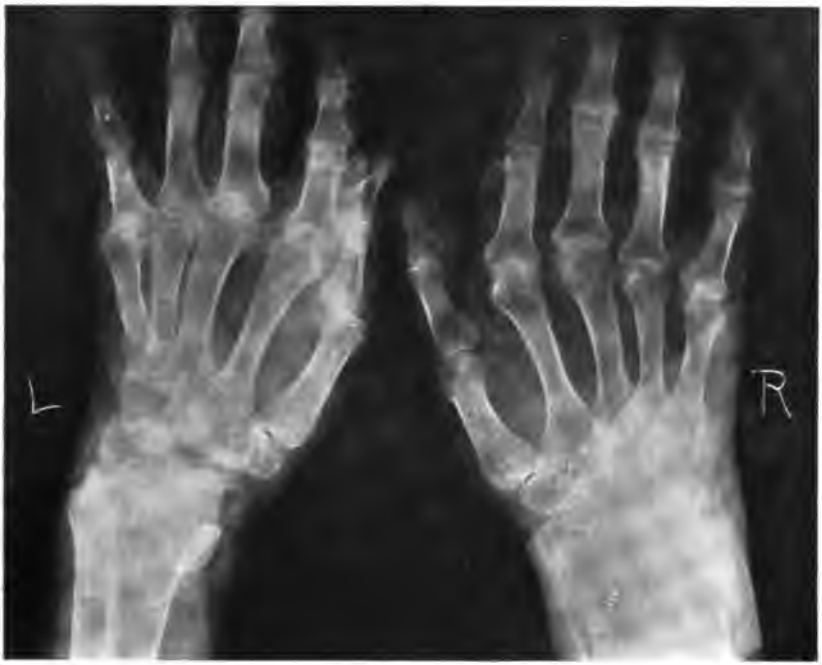
Rarefying lesion of patella. Wassermann positive. Relief of pain following anti-luetic treatment.

Fig. 4

Syphilitic osteoporosis of skull.

Digitized by Google

Fig. 5



Rheumatoid arthritis; painful fusion of wrist-bones; nearly every joint in hands somewhat involved.

Fig. 6

Rheumatoid arthritis, woman of fifty-seven, showing hypertrophic and atrophic changes.

Digitized by Google

The hyperplastic joint conditions best studied by X-ray are the large groups that come under the various forms of arthritis deformans (Figs. 5 and 6). The ankylosis from chronic rheumatic arthritis may show but little change in X-ray and yet the joints may be quite stiff. For example, Figs. 7, 8, and 9 illustrate joints of chronic rheumatism where in both hands and feet there is almost complete stiffness of years' standing.

ARTHRITIS	Inflammatory	Exudative	Acute articular rheumatism. Trauma with and without hemorrhage. Purpura (3 types), adult scurvy. Serous arthritis (serous exudate). Thickened capsule. Fibrillated cartilages. Gout (I). Lues. Tuberculosis, specific arthritis, purulent arthritis (adhesions chiefly fibrous).
		Productive or hyperplastic	Ankylosis from rheumatic arthritis. Arthritis deformans. Vascularization. Fibrous transformation and adhesions between cartilages of the joints.
	DEGENERATIVE, Destruction with atrophy	Senile	Arthritis ulcerosa sicca. Less proliferation, superficial erosion of cartilage, chiefly in hip.
		Neurotrophic (II)	Tabes. Syringomyelia. Myelitis with destruction of posterior columns. Acute anterior poliomyelitis.

(I) Deposits of uric acid salts, hippuric acid phosphates, and carbonate of lime in cells and matrix of cartilage, synovial membrane, ligaments, and soft tissues.

(II) Not always atrophic; synovial thickening and osteocartilaginous tumors may occur.

The so-called gonorrhœal spur on the heel (Fig. 10) may be painful for periods of time but all spurs are not gonorrhœal, nor are they painful. Quite large ones are discovered by accident when the ankle joint is X-rayed for other conditions (Fig. 11).

Extensive fusion of small bones may take place from acute infection and produce no symptoms. Fig. 12 illustrates such a condition in the wrist discovered quite by accident. The original infection had taken place in the palm of the hand.

Digitized by Google

Of typical acute gout we see but little in California, while the chronic manifestations, although very rarely extreme, are very common. Cataract, glaucoma, iritis, keratitis, and scleritis may all be the indices of chronic gout. Asthma, pleurisy, and pneumonia have accompanied exacerbations of typical gout. Epileptiform attacks, syncope, headache, psychical attacks have marked but also obscured the underlying gout.

There is no doubt that gouty individuals are markedly susceptible to inflammations of all kinds, and thrombosis and phlebitis may further complicate the picture. Dyspepsia of the acid type and vomiting are the digestive tract's contribution to the picture. Radiating pains from the spine, chiefly in the cervical region and due to gouty spondylitis, are confusing, especially as they suggest brachial neuritis. The distinct proliferative changes in the form of horn-like protrusions from the approximated edges of the vertebral column, seen chiefly, if not always, in the lumbar spine, and almost always regarded as related to streptococcus or staphylococcus infection, are said by Burnham, of the X-ray Department of the St. Francis Hospital, to be associated commonly with syphilis. Since he has called my attention to this fact I have frequently found a positive Wassermann reaction in these cases. However, we have found brachial neuritis, rigid spine with numerous fringe-like exostoses in young and middle-aged individuals in whom tuberculosis was the only historical infection. Kessel, in a recent number of the *Archives of Internal Medicine,* February, 1917, calls attention to hypertrophic osteo-arthritis in pulmonary tuberculosis, reporting on 32 cases, and adds that pronounced changes are more frequently present than ordinary routine examination shows, for they may produce no clinical symptoms. Our experience confirms this. For years we have looked for and recorded repeatedly bone changes in patients in whom there were no foci of infection and no history of chronic infection except the tuberculosis. The hands of one such case are shown (Figs. 13 and 14), and our records contain numerous examples of changes in the long bones and spine. Advanced degeneration of the kidneys of interstitial type may be present in people who later develop joint gout. The true gout kidney shows urates in the Malpighian bodies, uriniferous tubules, and necrotic areas in the medullary substance, and as a rule, follows other manifestations of gout. See Fig. 5 for illustrations of extra-articular deposits in chronic gout.

Digitized by Google

Fig. 7

Hand of same case as Fig. 9 at age of seventy-four.

Fig. 8

Recurrent osteo-arthritis—same case as Fig. 10—following walking exercise at time of San Francisco fire, 1906.

Digitized by Google

Fig. 9

Same case as Fig. 11 at age of eighty-four.

Fig. 10

Painful heel, gonorrhœal.

Fig. 11

Painless exostoses on heel; venereal warts fifteen years before; no gonorrhœa.

Digitized by Google

Fig. 12

Fusion of all bones of wrist; infection twenty-five years before. Bone condition discovered in X-ray for fracture. No symptoms.

Digitized by Google

Fig. 13

Fig. 14

Figs. 13 and 14.—Rheumatoid arthritis, woman of sixty. Fig. 13 shows a peri-articular chronic inflammation of twenty years' standing, with no joint involvement, in terminal joint of middle finger. Both plates show exostoses and extensive bone changes at some distance from the joints. Patient had tuberculosis of hip with discharging sinuses between ages twenty and thirty. Tonsils removed for chronic infection three years ago, but with no benefit.

Digitized by Google

Fig. 15

Gout, man, age sixty-five.

Digitized by Google

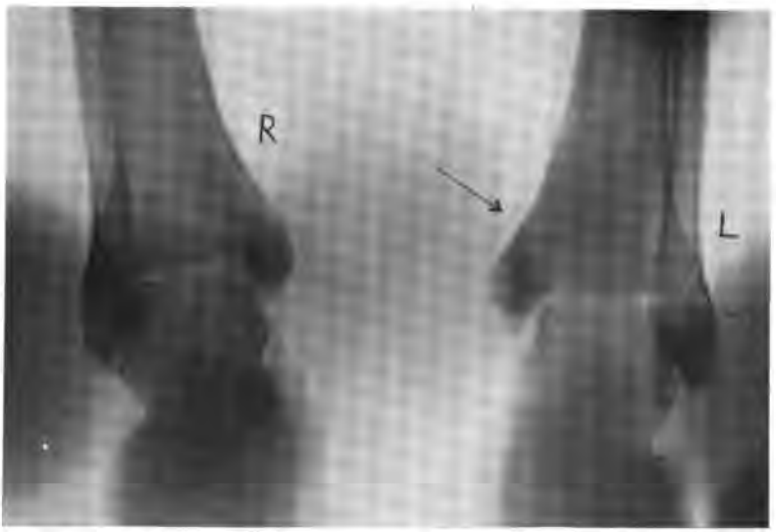
Fig. 16

Sarcoma breaking through periosteum.

Fig. 17

Same two months later. Treatment by X-ray and Coley's fluid. Marked increase in disease.

Fig. 18



Sarcoma of lower epiphysis and end of left tibia—early in course. Joint pain, no swelling.

Digitized by Google

Fig. 19

Carcinoma tibia. Pathologic fracture, metastatic lesion following malignant uterus removed three years previously.

Digitized by Google

Digitized by Google

We hear much of acidosis in connection with a good many acute diseases, and it was hoped that some joint disturbances beginning acutely might be differentiated by metabolism studies in this field. For long periods of time bicarbonate of soda has been used in various joint affections, particularly acute articular rheumatism, with the purpose of overcoming the supposed acidity. Sellards found increased tolerance to soda bicarbonate in rheumatic fevers, and recently Frothingham, in an extensive study of these conditions, states that it is fair to say that some form of acidosis occurs in certain cases of acute rheumatism which "shows up in one or the other of these tests;" *i.e.*, carbon dioxide tension, soda bicarbonate tolerance, acetone, and ammonia nitrogen. It was interesting to observe that gout, gonorrhœal arthritis, syphilis, chronic arthritis, besides a large range of acute infections, showed no acidosis by any test.

Sarcoma of the epiphysis following acute joint pain has occurred in two cases of peculiar interest. Both of these were young men, and neither had had trauma. In both there was great pain long before there was swelling. Both were diagnosed entirely by X-ray, and one only after securing negative Wassermann and tuberculosis tests. These two cases are illustrated to show how important is the X-ray in the diagnoses of these diseases (see Figs. 16, 17, 18, and 19).

In this connection it is important to discuss briefly the question of sarcoma following trauma. Frequent claims for fracture, etc., have been made under the operation of the interstate accident laws, and claims also have been allowed where sarcoma has been said to follow injury to bone. Coley is authority for the statement that within a few days after injury X-ray findings revealed tumor. In the light of our extensive experiences in the Railroad Hospital we do not believe that any of these cases are other than the fractures of already diseased bones, and that the trauma of these joints and bones is a result of the disease and not of actual injury. In one case where a man claims to have sprained his ankle while alighting from an automobile an X-ray ten and sixty days later showed the same tumor developments in the ankle. It is ridiculous to suppose that the so-called sprain was other than brought about by an already existing disease. A change that would have been obvious in ten days would have been very much magnified had the same rate of development gone on for the whole sixty days. The medico-legal aspect of this case and the importance of these pictures can not be too much emphasized.

Digitized by Google

HERNIA OF THE LUNG: WITH REPORT OF CASE OF SPONTANEOUS HERNIA OF THE RIGHT LUNG*

BY ELMER H. FUNK, M.D.
Philadelphia

A SPONTANEOUS protrusion of the lung through a defect in the chest wall is an exceedingly rare condition. Many clinicians of experience have never seen a case, and modern text-books, as a rule, make but a passing reference to its rarity, if they mention it at all. A few monographs on chest diseases are exceptions, notably the more recent ones of Lord, and Norris and Landis. The first observation of lung hernia is attributed to Roland, in 1499. The more important recent contributions on the subject are those by Auler, who in 1892 collected 51 cases, and by Urbach, who in 1909 added 33 more cases. Since this time a few additional cases have been reported, and, although the writer has not looked up every reference to the subject, it may be safely estimated that the number to date is well below a hundred.

REPORT OF CASE

C. C. (Hist. F 2020), male, white, furniture polisher, aged forty-three, was admitted to the Jefferson Hospital Department for Diseases of the Chest, November 10, 1915, died January 1, 1916. Father died of pneumonia, mother died of tuberculosis. *Present illness* began July, 1913, with loss of appetite, weight, and strength. He attributed a slight cough to excessive smoking. In November, 1914, a slight hæmoptysis occurred. He was admitted to a sanatorium for seven months, during which time he improved, but after discharge he soon relapsed. Upon admission to our wards he was suffering from a moderate cough, productive of a considerable quantity of a thick, yellowish sputum, moderate fever, and occasional night-sweats. The *physical examination* revealed marked emaciation, pyorrhœa alveolaris, a few palpable cervical glands, and clubbing of the fingers, with incurvation of the nails. The chest was somewhat

---

* From the Department of Medicine of the Jefferson Medical College, Philadelphia.

Digitized by Google

flattened on the right side, and about one inch to the right of the sternum in the first interspace a small bulging was seen when the patient coughed. It was about one and a half inches in diameter and elevated about half an inch above the surrounding surface. This bulging, as a rule, appeared only when the patient coughed, although occasionally it persisted for some minutes, or until reduced by manipulation with the fingers. The bulging was soft, elastic, and crepitated like lung tissue. It was not painful, although slightly tender at times, especially upon manipulation. The examination of the lungs revealed extensive bilateral tuberculosis, with cavity formation upon the right side. Tubercle bacilli were found in the sputum. The patient died of progressive asthenia and no autopsy was allowed.

DISCUSSION

A protrusion of lung through a defect in the chest wall may occur as a result of (1) *congenital* deficiencies, such as sternal clefts or gaps in the thoracic wall caused by arrested growth of the sternum, ribs, or musculature; (2) *traumatism* (*e.g.*, penetrating wounds due to knife, sabre, bayonet, shell, etc.), or (3) *spontaneously* as in our case, in which without any previous trauma the hernia appeared as a result of long-continued strain in coughing. The traumatic variety is the most frequent. The supraclavicular bulgings, which are not infrequently seen in patients with emphysema and in emaciated tuberculous patients with distressing coughs of long duration, are not, as a rule, instances of true hernia of the lung, although a true cervical or supraclavicular pulmonary hernia may occur. Grant reports such a case in which a tumor the size of a walnut appeared above the clavicle in the anterior triangle of the neck. When the swelling was reduced the finger could follow through an opening, reminding one somewhat of an opening in an ordinary inguinal hernia. The diaphragmatic hernias are in most instances protrusions of abdominal contents into the thoracic cavity, and only exceptionally the reverse. Beale reported a hernia of the lung which took place through the diaphragm ruptured by an abdominal squeeze.

In the 84 cases collected by Auler and Urbach the relative frequency of the various forms of pulmonary hernia was found as follows: Congenital, 20 (24 per cent.); traumatic, 37 (44 per cent.); spontaneous, 26 (31 per cent.); unknown, 1 (1 per cent). In our

Digitized by Google

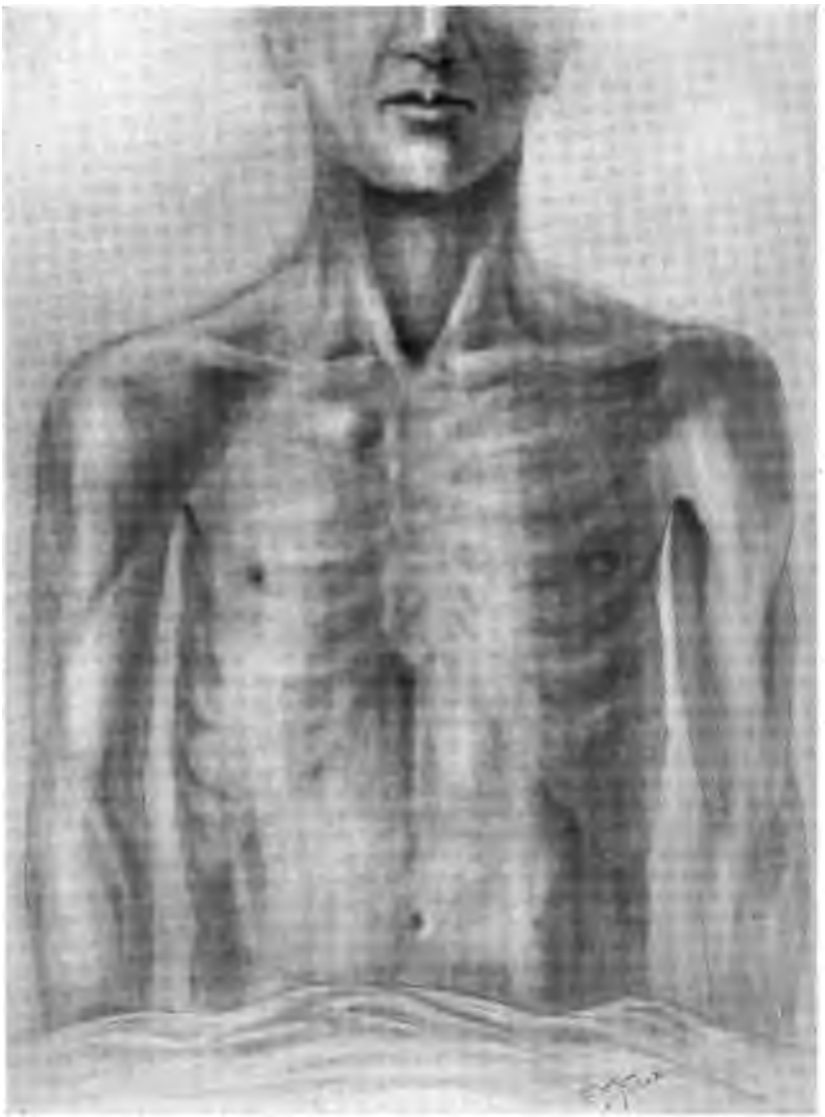
discussion of pulmonary hernia we will deal principally with the spontaneous form.

1. Congenital pneumonocele is due to some developmental defect of the chest wall. At birth nothing unusual about the child's chest may be noticed until the first respirations expand the airless lungs, and then, as in Beiser's case, a swelling appears and becomes larger as the child cries. It may be some months or years in appearing, as in Polya's patient, and because of this the question may arise regarding its congenital origin. On the other hand, a traumatic hernia may occur early in life and simulate a congenital hernia, as in the following case reported by Bell. An infant of thirteen months showed at birth a hernia about the size of a walnut, which increased in size until it approximated that of a hen's egg. It was located in the axillary line about three inches below the axilla, and the doctor in attendance at the time of delivery believed it was the result of a broken rib. At operation no congenital defect was found, and it was shown to pass between the ribs, which were normal. The patient recovered.

2. Traumatic pneumonocele is exceedingly rare, compared to the great number of penetrating wounds of the chest wall. During the Civil War only three cases of lung hernia were reported, and during the Russian-Japanese War only five cases were reported among 20,000 wounds of the chest (Adams). Küttner, in an extensive experience in South Africa, found no case, and Makin but one case in which this accident occurred. It may not follow immediately upon an injury, but occur later after healing of the wound, due to continued localized weakness of the chest wall (secondary traumatic pulmonary hernia). Trevisano describes a hernia of the lung at the site of repeated punctures for pleurisy and where the scar had gradually thinned out and stretched. The rarity of protrusion of the lung following penetrating wounds of the chest is due to the inherent elasticity of the lung, which causes it to contract and retract from the chest wall when the intrapleural and intrapulmonic pressures become equal in the presence of an opening into the pleural cavity. The usual result of such an injury is pneumothorax. That this does not always occur is emphasized by Dutta's case of a penetrating wound of the chest wall in which a portion of protruding lung was caught and fixed between the fragments of a broken rib. Many writers prefer

Digitized by Google

FIG. 1



Anterior wall of chest, showing a small bulging about one inch to the right of sternum in the first interspace. The bulging is soft, elastic, and crepitant like lung tissue. It appeared, as a rule, only when the patient coughed, although at times it persisted for some minutes, or until reduced by manipulation. It was not painful, although slightly tender upon manipulation.

Digitized by Google

Digitized by Google

the term, prolapse of the lung, to that of hernia of the lung, in those cases in which a protrusion occurs as a result of a penetrating wound. Traumatic hernia of the lung, however, may occur without external wound. Contusions, falls, squeezes, etc., may fracture the ribs or sternum or tear the musculature, and allow the lung to protrude beneath the skin.

3. Spontaneous or non-traumatic pneumonocele results when a weakened portion of the chest wall gives away under the strain of increased intrathoracic pressure. This may be produced in a variety of ways, such as long-continued coughing (our case), lifting (Adams, Urbach, Massoti), blowing a wind instrument (Wightman), crying (Grant), the pains of labor (Boerhaave), etc. Coughing is perhaps the most frequent factor, and, of the various pulmonary conditions, emphysema and chronic bronchitis the most common. Frühwald's patient developed a hernia during the course of whooping-cough.

The pneumonocele is usually in front or to the side, or, rarest, behind, as in the case reported by Wightman, in which the tumor was situated opposite the seventh and eighth dorsal spinous processes on the left side. The tear in the musculature is usually in definite places, as Morel-Lavallé pointed out. These places are anteriorly near the sternum and posteriorly at the angle of the ribs. Anteriorly the external intercostals end at the junction of the rib and costal cartilage, and only the internal intercostals, together with the intercostal external ligaments, form the covering of the spaces. Posteriorly the internal intercostals end at the angle of the ribs, and the external intercostals, with the intercostal internal ligaments, form the covering of the spaces. The thick muscles of the back form an added support which the front does not have. In a study of the site of the spontaneous pneumonocele in 26 cases Urbach found the following: first interspace 6, second interspace 2, fourth interspace 1 (posteriorly), fifth interspace 3 (2 axillary), sixth interspace 3, seventh interspace 2, eighth interspace 1, substernal 1, and supraclavicular 7.

The lung hernia is usually unilateral, but it is interesting to note that in three of the reported cases it was bilateral (Urbach, Chaussier, Morel-Lavallé). Chaussier's patient developed a hernia in the left eighth interspace, and one year later in the seventh right interspace. In Pietkiewitz's patient there were two hernias, both on the left side—

Digitized by Google

one between the sixth and seventh ribs in the nipple line and the other between the fourth and eighth ribs in the scapular line (West).

The supraclavicular forms of pulmonary hernia form a rare and interesting group. As previously stated, the fulness above the clavicles, which is not infrequently seen in emphysema, is not, as a rule, a true hernia. A true hernia of this region, however, may occur and Farr collected seven cases of spontaneous pneumonocele of this region. The apical parietal pleura and the deep cervical fascia, with the overlying muscles, limit the excursion of the tops of the lungs. Local weakness due to general disease, with increased expiratory efforts, may give rise to supraclavicular fulness or bulging. In some cases it has been suggested, as Farr points out, that this "cul-de-sac" might extend abnormally high through some congenital anomaly. In others a definite opening into this wall may be felt when the protruded lung is reduced.

The diagnosis of spontaneous pneumonocele ought not to occasion any very great difficulty. Various writers have called attention to the need of differentiating it from other localized bulgings of the chest wall; *e.g.*, perforating empyema, aneurism, perforating lung abscess, tuberculous abscess, tumors of chest wall, such as fibroma, lipoma, angioma, and sarcoma, echinococcus cyst, localized emphysema of skin, abdominal hernia intercostalis. A careful consideration of the history, a thorough examination of the entire thorax, and the recollection that the pneumonocele, as a rule, presents a smooth, soft, elastic, crepitant swelling, resonant upon percussion, reducible partly or completely by gentle pressure or upon deep inspiration, enlarged on deep and forcible expiration, as in coughing, will prevent diagnostic errors.

TREATMENT OF SPONTANEOUS PNEUMONOCELE

The individual experience in these cases is so limited and the conditions in the patients so varied that dogmatic statements with regard to treatment are not possible. In a recent, reducible hernia associated with grave pulmonary disease (as in our case) the wearing of a pad and the limitation, as far as possible, of the cough is the only feasible treatment. In a recent reducible hernia which appears only upon excessive expiratory efforts, such as the blowing of wind instruments, etc., the removal of the strain factor may be all that is necessary. However, as Wightman points out, a recent hernia, though usually

Digitized by Google

easily reducible, soon becomes irreducible by reason of adhesions, and hence treatment short of operation is useless as a remedial agent after the first few days. Wightman's case was remarkable, in that upon incision it was found that nature had completely cut off the protruding portion of lung and it lay beneath the muscles as an isolated and circumscribed tumor, which was easily removed. If producing much inconvenience, operation with reduction of the lung and suture of opening, or ligature of protruding lung with suture of opening, may be practised. The latter operation was performed on Bell's patient, an infant of thirteen months, with recovery in four weeks.

REFERENCES

ADAMS: *American Medicine*, 1911, 17, 41.
AULER: *Beitrag zur Kenntniss des Lüngenbrüche*, Inaug. Diss., Berlin, 1892.
BEALE: *Lancet*, 1882, 1, 139.
BEISER: *Archives Pediatrics*, 1894, 11, 755.
BELL: *Edinburgh Hosp. Reports*, 1893, 1, 471.
CHAUSSIER: *Bull. de la faculté de médecine*, 1810–11, 4.
DUTTA: *Indian Med. Gaz., Calcutta*, 1904, 34, 378.
FARR: *Medicine*, 1904, 10, 359.
FRÜHWALD: *Jahrb. f. Kinderheilk*, 1885, Bd. 23.
GRANT: *Colorado Medical Journal*, 1896, 2, 379.
KÜTTNER: "Kreigschir. Ehrfahr., Kriege," 1900.
LORD: "Diseases of the Bronchi, Lungs and Pleura," Philadelphia, 1915, 448.
MAKINS: "Surgical Experiences in South Africa," 1899–1900.
MASSOTI: *These de Paris*, 1897.
MOREL-LAVALLÉ: *Mem. de la Soc. de Chir. de Paris*, 1847.
NORRIS and LANDIS: "Diseases of the Chest," Philadelphia, 1917, 517, 1st Ed.
POLYA: *Centralb. f. Chir.*, 1909, 923.
ROLAND: Quoted by Urbach, *loc. cit.*
TREVISANO: *Gaz. degli osped. e stelle cliniche*, 1904, No. 16.
URBACH: *Deut. Zeit. f. Chir.*, 1909, 102, 89. This article contains an excellent bibliography.
WEST: "Diseases of the Respiratory Tract," 1902, 2, 874.
WIGHTMAN: *British Medical Journal*, 1898, 1, 365.

Digitized by Google

SOME PATHOLOGIC CONDITIONS OF THE NAILS

(VARIOUS FORMS OF LEUCONYCHIA, TRANSVERSE GROOVING, INCURVED NAILS WITH CLUBBED FINGERS, CONGENITAL INGROWING NAILS)

BY F. PARKES WEBER, M.A., M.D., F.R.C.P.
London

LEUCONYCHIA OR CANITIES UNGUIUM

For convenience I shall divide cases of leuconychia into classes (three of them being those given by Unna): (1) Leuconychia totalis; (2) leuconychia of similar appearance, but incomplete; (3) leuconychia striata; (4) leuconychia or leucopathia punctata. Of this last (punctate) form I shall say no more, as the white spots on the finger-nails ("flores unguium") which constitute "leuconychia punctata" are so common that every one is familiar with them. They may sometimes be produced by slight traumatisms and by local nutritional causes.

1. *Leuconychia Totalis.*—A typical case of this class was the one which, together with Doctor Krieg, I showed at the Dermatological Society of London in 1899.[1] I had a colored drawing made of the finger-nails by Miss Mabel Green and gave it to the late Dr. Radcliffe Crocker. By the courtesy of the authorities of the University College Medical School Library I am able to reproduce the drawing here (Fig. 1). The patient, W. B., aged fifty-two years, a milkman, who had an old rheumatic valvular affection of the heart, had noticed the white appearance of his finger-nails for about the last four years. All the finger-nails of both hands had become white and showed no lunula. They were slightly thinner than normal nails and were rather flat[2] ("platyonychia"); one of them might almost have been termed a "spoon-nail" ("koilonychia"). They presented longitudinal grooves. The folds of skin covering the roots of the nails were slightly everted, but the patient said he had not pressed or attempted to press the skin back. He had no skin eruption on the fingers or on any part of the body. The toe-nails showed similar whiteness, but to a lesser degree. The patient likewise exhibited a little chronic rheumatic deformity of the small joints of the hands

[1] Weber and Krieg, *Brit. Journ. of Dermatology*, London, 1899, vol. xi, p. 120.
[2] According to Unna, soft nails frequently show a tendency to be flattened.

Digitized by Google

FIG. 1

FIG. 2

FIG. 1.—Leuconychia totalis.

FIG. 2.—Transverse grooves in the finger-nails from prolonged cold weather. The condition is very asymmetrical in this case.

Digitized by Google

Digitized by Google

and feet. This was one of the earlier of the cases of the kind to be described.

P. G. Unna's case[3] was in a young man, aged twenty-six years, some of whose hairs (hairs of the head) were affected with "leucotrichia," or, rather, with the congenital and sometimes inherited condition known as "ringed hair." The surface of the finger-nails was smooth, and they were somewhat flattened. Their peculiar whiteness had apparently been present from childhood or from birth. The toe-nails were normal.

S. Giovannini's case[4] was that of a coachman, aged twenty-nine years, in whom the leuconychia (or "canities unguium," as Giovannini calls it) commenced at the age of twelve years, after an attack of typhoid fever. The toe-nails and the hair were unaffected. It may also be noted that in the patient and his mother there was webbing (syndactylia) of the second and third toes in both feet.

Max Joseph[5] has published two cases. One was in a previously apparently healthy butcher, aged twenty years, whose finger-tips were swollen and painful for a time before the leuconychia developed. The other was in an anæmic girl.

In 1898, Leo Forscheimer[6] published a case in which there was likewise present a condition of spoon-nails[7] ("koilonychia"). The

[3] Unna, "International Atlas of Rare Skin Diseases," 1891, plate xix, No. 3; "Histopathology," English edition, 1896, p. 1050.

[4] S. Giovannini, "International Atlas of Rare Skin Diseases," 1891, plate xix, No. 1.

[5] Max Joseph, "Neisser's Stereoscopischer Med. Atlas," 1896, Tafel cxcix; article on diseases of the nails in *Berliner Klinik*, 1902, Heft 173.

[6] L. Forscheimer, "Ein Fall von Leukonychie verbunden mit Koilonychie," *Dermat. Centralblatt*, Berlin, 1898, vol. ii, p. 33.

[7] The concave condition of the nail-plate, known in England as "spoon-nail," was described under the heading "Koilonychia," by Julius Heller (Cf. J. Heller, "Krankheiter der Nägel," Berlin, 1900, p. 134). On koilonychia see also F. Bering, "Zur Kasuistik der Nagelerkrankungen," *Muenchener med. Wooh.*, 1903, l, p. 1777. Graham Little (1906) showed a case of koilonychia of about 12 months' duration, in a young woman, who was otherwise in fair health and lived in the country. Little mentioned that no parasite had been discovered in his case or in other recorded cases (*Brit. Journ. Dermat.*, 1906, vol. xviii, p. 290). Koilonychia may apparently be connected with a process of subungual hyperkeratosis (Heller), or may be the result of a dystrophy due to faulty nutrition at the nail-matrix (Ohmann-Dumesnil). G. Pernet (*Brit. Journ. Dermat.*, 1905, vol. xvii, p. 458) showed a woman with koilonychia of finger-nails greatly improved by use of arsenic. L. Waelsch (*Arch. f. Dermat. u. Syph.*, 1903, vol. lxvii, p. 250) described a familial condition of congenital "koilonychia" in three generations.

Digitized by Google

patient was a girl, aged seventeen years. The fingers only were affected, and not all of them.

S. Bettmann,[8] in 1906, described the case of a young woman, aged twenty-three years, all of whose finger-nails were affected with leuconychia totalis. The patient had likewise had epileptiform convulsions, attacks of "local syncope" in the fingers, urticarial eruptions, and vitiligo.

Hedderich[9] described the case of an apparently healthy man, aged twenty-eight years, with leuconychia totalis of his finger-nails, which had apparently existed from childhood or from birth. Excepting for their whiteness, the finger-nails seemed normal. The toe-nails were not affected. There was nothing special in the family history.

Gutmann, in 1913, demonstrated[10] a man, aged thirty years, all of whose finger-nails had had a bluish-white color since his earliest childhood. The patient's father had from early life had a similar peculiarity of the finger-nails. The case was therefore probably of congenital origin. There was nothing else abnormal in the patient's skin or cutaneous appendages.

At the Dermatological Section of the Royal Society of Medicine, on February 20, 1908, Graham Little showed an example of leuconychia in a young man, aged seventeen years, in fair general health. The case was unfortunately not fully described.[11] In P. Colombini's case of "canities unguium"[12] the leuconychia was apparently not quite complete. The patient, a man aged thirty-two years (normal in other respects), was the only member of his family affected and did not know how long the leuconychia had been present. His occupation was that of a pedlar.

2. *Incomplete Leuconychia.*—Cases of leuconychia more or less similar in appearance to leuconychia totalis, but incomplete, are, I believe, not rare. I shall refer shortly to cases I have seen. Several of them were associated with appreciable thickening of the

[8] S. Bettmann, *Dermat. Zeitschr.*, Berlin, 1906, vol. xiii, p. 461.

[9] Hedderich, *Dermatolog. Centralblatt*, Leipzig, 1910, vol. xiii, p. 264.

[10] Gutmann, Verein der Aerzte Wiesbadens, report in the *Berliner klin. Wochenschrift*, 1913, 1, p. 1459.

[11] Graham Little, *Brit. Journ. of Dermat.*, London, 1908, vol. xx, p. 84.

[12] P. Colombini, *Riforma medica*, Napoli, 1894, Anno X, vol. iii, p. 2.

Digitized by Google

nails, termed "scleronychia" by some writers. One patient was a subject of hereditary xerodermia or ichthyosis.

J. W. B., aged twenty-three years, single, who had been a stoker in the Royal Navy, was admitted under my care at the Mount Vernon Hospital, April 21, 1908, with pulmonary and laryngeal tuberculosis. The finger-nails were relatively white, but the lunulæ could still be made out. There was likewise a moderate degree of leuconychia of the toe-nails. He had scarring on the ears, which he said was due to chilblains. Though he used to suffer from chilblains on the ears, he never had chilblains on the hands or feet.

A. C., aged fourteen years, a schoolgirl, was admitted on February 5, 1908, under my care at the Mount Vernon Hospital, with fairly advanced pulmonary tuberculosis (with tubercle bacilli in the sputum). She had irregular hectic fever, accompanied sometimes by a cyanotic type of hectic flushed cheeks. The nails of all her fingers and thumbs were white, with the exception of a narrow transverse band of red at the ends, adjoining the free portions of the nails. There was a similar appearance, but less definite, in the toe-nails.

G. F. C., a man, aged thirty-one years, was admitted on February 7, 1910, under my care at the Mount Vernon Hospital, with pulmonary tuberculosis (tubercle bacilli in the sputum) of at least four years' duration. He had incomplete leuconychia. The opacity of his finger-nails and his toe-nails was about equal. The nails, or at all events most of them, showed no lunula. The patient was a subject of ichthyosis, which he had inherited from his father. His father, however, was said to have been free from ichthyosis fifteen years before he died (at the age of forty-nine years) from so-called "acute ascending paralysis."

V. C. E. T., aged thirty-nine years, a well-built man, whom I examined for life assurance in September, 1904, seemed to enjoy good health, though he was subject to slight boils at the back of the neck, and on one occasion a decided trace of sugar was detected in his urine. Both his thumb-nails were almost white and showed no lunula. They were well-shaped, though rather thick, presenting a combination of leuconychia with scleronychia.

L. S., aged fifty-two years, a man suffering from bronchitis, arteriosclerosis, and chronic interstitial nephritis (no retinal changes),

Digitized by Google

was under my care in the hospital during part of 1907. His finger-nails showed incomplete leuconychia and were flattened and somewhat thickened. No lunula was visible in his thumb-nails, which were more affected than the other finger-nails. His toe-nails were unaffected.

M. S., aged sixty-nine years, a woman suffering from ascites and supposed Hodgkin's disease, was under my care in the hospital during part of the year 1907. Her finger-nails, which showed no proper lunula and were incurved and slightly thickened, were almost white, excepting near the roots (proximal portions) and near the free margins (distal portions).

H. L. F., aged sixty-five years, an architect, whom I saw first in 1907, showed similar incomplete leuconychia of the finger-nails. He suffered from chronic gout in the feet, with occasional acute exacerbations.

In the case of M. S., an elderly gouty lady with glaucoma, the incomplete leuconychia affected both the finger-nails and the toe-nails.

Another example (1910) of incomplete leuconychia of the finger-nails was the case of R. J. W., a man, aged forty-five years, who had contracted syphilis eighteen years previously, and had, ten years afterward, suffered from temporary diplopia and, somewhat later, from a "break-down," probably connected with nervous syphilis. He still had certain nervous symptoms, and his cerebrospinal fluid (but not his blood-serum) gave a positive Wassermann reaction. His nervous (pseudo-neurasthenic) symptoms improved under anti-syphilitic treatment.

In T. L., aged forty-nine years (1907), a robust man with a tendency to plethoric obesity, the thumb-nails and nails of the great toes were especially affected. The thumb-nails, somewhat thickened, were white, with the exception of their proximal portions, which corresponded apparently to the lunulæ. In fact, the color distribution on ordinary thumb-nails was reversed in this man's case.

To the class of scleronychia with more or less leuconychia belongs perhaps the "Case showing an abnormal condition of the nails of the hands, associated with secondary carcinomatosis," demonstrated by E. G. Fearnsides for H. Head at the Dermatological Section of the

Digitized by Google

Royal Society of Medicine on March 21, 1912.[13] The patient was a married woman, aged thirty-nine years, with abdominal malignant disease, probably of two or three years' duration. The change in the finger-nails was of four months' duration, and was first noticed just in front of the roots. The portions of the finger-nails which had grown during the last three months were thickened, opaque, and horny; the distal portions were fairly normal. The nails of the toes were only slightly affected. The Wassermann reaction was negative.

To the same class I am inclined to assign the case of yellow thickened nails, recorded by W. K. Sibley,[14] in a man aged twenty-three years, who had contracted syphilis two years previously—and so also some of the cases of temporary "discoloration" of the nails observed during convalescence from severe illness, etc.[15] Rather different appears to be the condition described by J. Nevins Hyde,[16] as purplish-white "egg-shell nails" observed in young women.

3. *Leuconychia Striata.*—Cases of this class are rare, but a good many have been described. A remarkable example has recently been recorded by W. K. Sibley,[17] to whose paper I am likewise indebted for references to many other cases. Sibley's case was that of a hairdresser, aged twenty-five years, who stated that for some fifteen years he had noticed transverse white bands appearing and disappearing on each of his finger-nails. The bands generally commenced at the base of the finger-nail and gradually, with the growth of the nail, moved towards the free end. Occasionally, however, a band would appear or disappear more or less suddenly on any part of the nails. The case is very well illustrated by a photograph of the man's hands.

Of previously published cases of leuconychia striata referred to by Sibley, one of the best known is that recorded by R. B. Morison,

[13] Fearnsides, *Proc. Roy. Soc. Med., Dermat. Section*, 1912, v, p. 102 (with illustration).

[14] W. K. Sibley, "Ungues flavi," *Brit. Journ. Dermat.*, London, 1911, vol. xxiii, p. 288.

[15] Cf. E. Geber, in "Ziemssen's Diseases of the Skin," English translation, 1885, p. 485.

[16] J. N. Hyde, "The Egg-shell Nail," *Journ. Cut. Dis.*, 1906, vol. xxiv, p. 145, with colored plates.

[17] W. K. Sibley, *Brit. Journ. Dermat.*, 1911, vol. xxiii, p. 281.

Digitized by Google

of Baltimore.[18] The patient was a young woman, aged twenty years, who suddenly developed irregular wavy bands across her finger-nails. These disappeared after a few months. The toe-nails were not affected.

In Langdon Down's case [19] (a professional man) there were two distinct sets of white lines extending transversely right across his fingers and toes, especially marked on those of the left limbs. They followed two attacks of "nervous break-down," which were accompanied by corneal ulceration and great general nervous prostration, with intermittent cardiac action, apparently the result of overwork.

With Langdon Down's case we may compare one alluded to by Sir Jonathan Hutchinson, in the *Archives of Surgery* for 1899,[20] a man aged thirty-four years. The fingers were affected, but not the toes; there was a history of attacks of nervous palpitation.

A. Vogel (1870) described and illustrated transverse white bands and ridges across the finger-nails as a result of febrile diseases;[21] and in 1877, Morris Longstreth[22] drew attention to some white bands which appeared in his own nails, corresponding to each pyrexial period of an attack of relapsing fever. J. M. Da Costa, on the same occasion,[23] demonstrated the case of a boy, aged thirteen years, who had developed transverse white bands on his nails in connection with a relapsing form of typhoid fever. Similar, but less distinct, lines were present on the toe-nails. Da Costa applied the curious term, *anæmic streaks,* to these white markings. As the nails in these cases, or some of these cases, were also slightly ridged (cf. Vogel's illustration), they are connected with another group which I shall discuss further on; namely, that of transverse grooving of the nails, or "Beau's lines."

Bielschowsky[24] (1890) described and pictured a case in which

[18] R. B. Morison, "Leucopathia unguium," *Vierteljahrschrift f. Derm. u. Syph.*, Wien, 1888, vol. xv, p. 1 (with colored illustration); *Medical News*, Philadelphia, 1887, vol. 51, p. 430.

[19] Langdon Down, *Trans. Path. Soc. Lond.*, 1870, vol. xxi, p. 409.

[20] Sir J. Hutchinson, *Archives of Surgery*, London, 1899, vol. x, p. 246.

[21] Alfred Vogel, *Deut. Arch. f. klin. Med.*, Leipzig, 1870, vol. vii, p. 333, and plate iii.

[22] Morris Longstreth, *Trans. Coll. Physicians of Philadelphia*, 1877, 3d Series, vol. iii, p. 113.

[23] Da Costa, *Ibid.*, p. 110 (with colored plate).

[24] Bielschowsky, *Neurolog. Centralblatt*, Leipzig, 1890, vol. ix, p. 741, with illustration.

Digitized by Google

pale transverse bands, milky white in the centre, but somewhat pink on either side, developed across the finger-nails of a man, aged forty years (with an earlier history of syphilis), suffering from multiple peripheral neuritis. The bands were seen to originate from the formation, rapid growth, and coalescence of many whitish spots. The toe-nails were not affected.

Bielschowsky's case was one of Eger's patients, and Eger,[25] in 1905, returned to the subject and described two other cases. The first was in a woman aged forty-one years, and the change in her nails followed by a few weeks an attack of typhoid fever; the nails of all her fingers and toes were affected. The second was in a woman aged fifty-nine years, and the change in her nails commenced a few weeks after an attack of toxic gastro-enteritis; the finger-nails, but not the toe-nails, were affected.

In a case of acanthosis nigricans (possibly associated with abdominal malignant disease) demonstrated by Radcliffe Crocker [26] the presence of a broad transverse white band on the nails was pointed out by G. Pernet.[27]

H. Lawrence [28] (1893) recorded the familial (and probably congenital) occurrence of leuconychia striata in a middle-aged man and his son.

F. J. Stout [29] (1894) described the case of a nervous waiter, aged twenty-one years, who, in addition to some scrofulous lymphatic glands, presented curious wavy white lines and spots on his finger-nails and, to a lesser degree, on his toe-nails.

I must now refer to certain cases of leuconychia striata apparently connected with the taking of arsenic. C. J. Aldrich, in 1904, wrote a paper on the subject, entitled "Leuconychia Striata Arsenicalis Transversa," [30] in which, besides his own cases, he discussed the action of arsenic on the nails; he likewise quoted several cases of

[25] Eger, "Ueber Nagelveränderungen nach acuten Krankheiten," *Berliner klin. Wochenschrift*, 1905, xlii, p. 607, illustrated.

[26] Radcliffe Crocker, *Brit. Journ. Dermat.*, 1899, vol. xi, p. 116.

[27] G. Pernet, remarks on a case shown by Fearnsides (see back), *Proc. Roy. Soc. Med., Dermat. Section*, 1912, vol. v, p. 104.

[28] H. Lawrence, *Australian Med. Journal*, 1893, New Series, vol. xv, p. 483.

[29] F. J. Stout, "Leucopathia Unguium," *Medical News*, Philadelphia, 1894, vol. lxiv, p. 212.

[30] Aldrich, *American Journal Med. Sci.*, Philadelphia, 1904, vol. 127, p. 702.

Digitized by Google

leuconychia striata of uncertain origin. E. S. Reynolds,[31] of Manchester, writing on the famous "beer epidemic" of chronic arsenical poisoning, mentioned the occurrence of white transverse ridges on the nails in arsenical cases. Florence Sabin [32] described transverse white lines on the finger-nails, one across each finger-nail, in a case of arsenical neuritis in a young woman.

I now come to *the pathology and ætiology of conditions of leuconychia.* W. Sykes [33] declared that in his own nails he could produce white specks by scraping, pressing back, and cutting the fold of the nail over the lunula. Sir Jonathan Hutchinson, it is stated, likewise thought [34] that white specks on the nails were often of traumatic origin. Heidingsfeld (see further on) thought that his own cases resulted from injury to the nail-fold by unskilled manicuring operations. His first illustration shows a hand in which the distal halves only of the nails were affected with leuconychia striata, the leuconychia having ceased after disuse of the "cuticle-knife." Unna [35] and Joseph,[36] by microscopic examination of affected portions of nails, came to the conclusion that the whiteness was due to the presence of air in the nail substance (air-spaces) in and between the nail-cells. Giovannini [37] attributed the change to abnormal cornification. M. L. Heidingsfeld [38] explained the leuconychia as a result of "parakeratosis," without any infiltration of air. He found the affected portions of the nails consisting of nail-cells which had retained their nuclei and their original form and could stain freely, owing to their having failed to undergo normal keratinization. Most writers apparently believe that such a process of parakeratosis is accompanied by infiltration of the nail-substance with air-spaces, and that the cause of the change is some interference with the nutrition

[31] E. S. Reynolds, *Lancet*, London, 1901, vol. i, p. 68.

[32] Florence Sabin, "A Case of Arsenical Neuritis," *Johns Hopkins Hosp. Bull.*, Baltimore, 1901, vol. xii, p. 221.

[33] Sykes, *Brit. Med. Journal*, 1897, vol. ii, p. 1260.

[34] Sir J. Hutchinson, however, in a note on the subject (*Archives of Surgery*, London, 1897, vol. viii, p. 372) merely quoted Sykes's memorandum.

[35] Unna, *loc. cit.*

[36] Joseph, *loc. cit.*

[37] Giovannini, *loc. cit.*

[38] Heidingsfeld, "Leucopathia Unguium," *Journ. Cut. Dis.*, New York, 1900, vol. xviii, p. 490.

Digitized by Google

at the nail-matrix, connected with traumatism, neuritis, gastric disorders, cardiac and circulatory diseases, febrile diseases, and various causes of local and general malnutrition.

In Sibley's [39] case of leuconychia striata the abnormal part of the nail "took the stain very readily, and appeared to be a mass of partly cornified layers of cells in several strata, with spaces between. Large cells which had retained their nuclei were clearly definable." Keratinization of the nail-cells had evidently remained deficient. Sibley, therefore, like Heidingsfeld, regarded the condition as due to a failure of the natural process of cornification. Similarly, in regard to his case of Ungues flavi (see back), Sibley wrote that "the superficial layers of the nail-substance took the stain fairly well, and revealed the presence of large, well-defined, nucleated nail-cells."

I shall here allude to a case described (1903) by Theodor Brauns,[40] because, though it should have been included among the other cases of incomplete leuconychia, there is an etiological point raised to which I should like to draw attention; namely, the influence of cold as a factor in the production of leuconychia. Brauns's case was that of an apparently healthy, well-nourished young woman, all of whose finger-nails, with the exception of that of her right thumb, were affected with partial leuconychia. The surface of the finger-nails was smooth and shiny; under the free borders there was some thickening. The toe-nails were not affected. Microscopical examination showed that in the affected (white) portions of the nails there was a parakeratosis, as in the above-mentioned cases, together with the presence of air-spaces between the cells, which had dried up and shrivelled. The patient's hands had been frost-bitten on the winter before the leuconychia developed, and it is stated that Riehl has had under his observation three cases of leuconychia associated with frozen fingers. I hardly think, however, that frost-bite can have played any part in most cases of leuconychia. Brauns suggested that cases of leuconychia should be classified, not as "leuconychia punctata," "leuconychia striata," etc., but under the headings, *leuconychia acuta* or *simplex*, and *leuconychia chronica* or *per-*

[39] Sibley, *loc. cit.*

[40] Th. Brauns, *Arch. f. Dermat. u. Syph.*, 1903, vol. lxvii, p. 63, with illustration. I have made use of an excellent abstract by Macleod.

Digitized by Google

stans. I do not see much advantage to be derived from that suggestion.

In regard to the *occasional association of leuconychia with abnormal conditions of the hair of the scalp,* I have already mentioned Unna's case of leuconychia totalis in which some of the hairs were "ringed"; that is to say, in which there was a peculiar kind of congenital partial "leucotrichia." It should also be noted that cases of leuconychia combined with alopecia[41] have been described by J. Darier and L. Le Sourd,[42] Brocq,[43] Sabouraud,[44] G. Pernet and P. Abraham,[45] and Ch. Audry.[46] Whether the association in these latter cases is one of nervous origin or whether both conditions are really of parasitic nature, like ringworm of the nails ("tinea unguium") and ringworm of the scalp, is, I believe, still uncertain.

TRANSVERSE GROOVING OF THE NAILS (BEAU'S LINES)

Of considerable clinical and pathologic interest are the fairly well-known transverse grooves or furrows (sometimes called "Beau's lines," in honor of the French physician who made a special study of the subject) which appear on the nails as the result of local or general nutritional defects, marking the date of relatively recent attacks of pneumonia and other severe illnesses, or—a point still not sufficiently recognized—of chilblainy local circulatory disturbances connected with prolonged exposure to cold weather, or attacks of paronychia of various kinds, the action of strong antiseptic solutions in specially susceptible individuals, local traumatisms, etc.

For the earlier history of the subject I shall quote the following passage from W. K. Sibley's article[47] already referred to (see back): "Changes in the nails accompanying general illness were first described by J. C. Reil,[48] of Halle, in 1792, and again, more

[41] Cf. Max Joseph, "Ueber Nagelkrankheiten," *Berliner Klinik*, 1902, Heft 173, pp. 28, 29.

[42] Darier and Le Sourd, *Ann. de Derm. et de Syph.*, Paris, 1898, 4 Série, vol. ix, p. 1009.

[43] Brocq, *Ibid.*, p. 1012.

[44] Sabouraud, *Ibid.*, p. 1012.

[45] G. Pernet and P. Abraham, *Brit. Journ. Dermat.*, London, 1900, vol. xii, p. 100.

[46] Audry, *Journ. des Maladies Cut.*, Paris, 1902, 6 Série, vol. xiv, p. 184.

[47] W. K. Sibley, *loc. cit.*

[48] J. C. Reil's *Memorab. Clinic.*, fasc. iii, Halae, 1792, p. 206.

Digitized by Google

fully, in his work 'On the Diagnosis and Treatment of Fevers.'[49] J. H. S. Beau, of Paris, in 1846, drew attention to the subject in his 'Note sur Certains Caractères de Séméiologie Rétrospective Présentés par les Ongles.'"[50] Sibley, continuing, says Beau "calculated that the nails of the fingers grow at about the rate of a millimetre a week, which on the average would mean five months for a whole nail, or rather more than two nails a year. The nails of the toes grow more slowly; that of the great toe takes four times this period. It becomes, therefore, a matter of easy calculation to fix the date of an acute illness or illnesses by the relative position of furrows on the nails. Sir Samuel Wilks,[51] in the *Lancet* of 1869 and 1870, recorded several cases of furrows on the nails as the result of acute illness, such as severe diarrhœa accompanied by great prostration, scarlet fever, a sharp attack of gout, acute rheumatism, diphtheria, and one case after starvation. His most remarkable case[52] was that of a healthy, well-developed, robust man, who, on August 29, and again on October 18 of the same year, suffered for three days from severe sea-sickness, after which all the nails on both his hands showed two distinct furrows, the position of which corresponded to the dates of the two attacks of sea-sickness. Murchison, in the second edition of his work 'On Fevers,'[53] also drew attention to the subject. Hutchinson[54] described furrows on the nails, especially after febrile and gouty attacks of illness, and records a case where bands of hemorrhage appeared in the nails after one illness and furrows after another. . . . In relapses, for instance,

[49] J. C. Reil, "Ueber die Erkenntniss und Cur der Fieber," Halle.

[50] J. H. S. Beau, *Archives Générales de Médecine, Paris*, 1846, 4 Série, vol. xi, p. 447.

[51] Sir Samuel Wilks, *Lancet*, London, 1869, vol. i, pp. 5, 66; and 1870, vol. i, p. 3. The existence of these transverse furrows was also recognized by Sir James Paget. Cf. Hutchinson, *Archives of Surgery*, 1897, vol. viii, p. 373.

[52] Wilks, *Trans. Path. Soc. Lond.*, 1888, vol. xxxix, p. 370.

[53] Charles Murchison, "On the Continued Fevers of Great Britain," Second edition, London, 1873. In the third edition, 1884 (pp. 136, 351, 517), Murchison mentions these grooves following typhus, relapsing, and enteric fevers.

[54] For a very unusual case of transverse furrows on the finger-nails following a prolonged attack of faintness and collapse, in which the patient (a man) was thought to be dying, see Sir J. Hutchinson, *Archives of Surgery*, London, 1897, vol. viii, p. 372. Fresh transverse furrows afterward followed attacks in which there was numbness of the hands. The condition of the nails was almost symmetrical.

Digitized by Google

in cases of typhoid fever, a second furrow might appear on the nails as a record of the fact. An analogous condition occurs on the hoofs of animals after severe illness, and the horns of cows often show a similar change after each parturition." Markings of the same significance have been observed, according to Hutchinson, on the wing- and tail-feathers of domestic fowls and other birds in captivity.

A more or less physiologic transverse grooving of the nails in infants has been described by B. Schick,[55] connected with temporary changes of nutrition at birth. Inasmuch as these grooves to some extent mark the date of birth and the duration of extra-uterine life, they may occasionally have a certain medico-legal importance.

In life assurance examinations the presence of Beau's lines on the finger-nails are not altogether without some importance. I remember my father, Sir H. Weber, telling me that on two occasions he detected these grooves when examining men for life assurance, both of whom had told him that they had had no recent disease. One of them, however, then admitted that he had not long since suffered from rheumatic fever; the other admitted that he had been ill with pneumonia.

Beau's lines following scarlet fever and measles have been described by E. Feer, of Basel, in an illustrated paper on the subject published in 1904.[56] Norman Flower[57] has recorded their appearance after operation for abdominal disease with suppuration and hypostatic pneumonia (good illustration), and in another case after empyema and double septic bronchopneumonia. A much rarer cause is malaria. P. L. Bosellini[58] was probably the first to draw attention to malaria as occasionally accounting for the presence of these transverse sulci. He gave an excellent illustration of the hands of his patient, a man, aged twenty years, showing marked symmetry in the condition. I have observed their presence in an old man (J. W. D.), aged seventy-three years, shown me in July, 1915, by Dr. G. F.

[55] B. Schick, "Die physiologische Nagellinie des Säuglings," *Jahrbuch f. Kinderheilkunde*, Berlin, 1908, vol. 67, p. 146. Schick gives references to previous observations on the subject by Leopold, L. Fürst, J. Heller ("Die Erkrankungen der Nägel," Berlin, 1900), and Hochsinger.

[56] E. Feer, *Muenchener med. Wochenschrift*, 1904, li, p. 1782.

[57] N. Flower, *British Medical Journal*, 1911, vol. i, p. 869.

[58] P. L. Bosellini, "Distrofia Aplasica Ungueale Malarica," *Giorn. Ital. d. Mal. Ven. e della Pelle*, Milano, 1915, vol. lvi, p. 255, with illustration.

Digitized by Google

Stebbing, at the Lambeth Infirmary, suffering from a severe form of leukæmia.

Sir Samuel Wilks,[59] in commenting on Norman Flower's paper (see back), though he acknowledged that there might be lesser degrees of the furrows, wrote: "My opinion is that the furrow and white line on the nails show the line of death or approaching death which takes place during the patient's illness. In all the cases I have seen or known where these marks have appeared the patient has been at death's door; he has been regarded by the medical man and friends as dangerously ill (and, indeed, in the jaws of death, unless he soon rallied), and then recovered. He has always become cold, pulseless, with death written on his face, causing the greatest anxiety to his friends, and in this state he may continue for some hours or several days. If he should fortunately recover, the sign of death is written upon him. . . . You say your patient was not expected to live, and the same was said of myself. After my operation I had blood-poisoning, and at the end of three weeks, having gradually got worse, I was given up by nurses and doctors. Doctor Pye-Smith told my daughter that I should not live through the day. I, however, turned the corner, and showed the event on my nails. Recently, as you know, I have had a far more serious illness as regards pain and the operation, but never at any time did the illness come to a climax, and so I do not present any signs of it at the end of my fingers."

But in writing the above Sir Samuel Wilks evidently did not think of the furrows sometimes resulting, in subjects peculiarly susceptible to cold weather, from chilblainy conditions of the fingers. Attention was, however, drawn to the chilblainy cases by J. Ewens in a letter published in the *British Medical Journal*[60] some months after Flower's paper appeared. Ewens specially alluded to the case of a man between seventy and eighty years of age; and in May, 1913, I saw an elderly man (A. J. C.), who had transverse grooves on some of the nails of one (the left) hand resulting from a chilblainy condition of the fingers during the winter. He told me he had noticed something like it after every winter for the preceding four or five years.

[59] Wilks, *Brit. Med. Journal*, 1911, vol. i, p. 869.

[60] J. Ewens, *Brit. Med. Journal*, 1911, vol. ii, p. 755.

Digitized by Google

A point, possibly of occasional clinical importance, in regard to the transverse grooves resulting (in specially susceptible individuals) from chilblainy circulatory conditions, is that, as in the preceding case, they are likely to show great want of symmetry in the two hands—much more so than the grooves do which are due to severe illnesses. Fig. 2 well illustrates the asymmetry of the grooves resulting from a cold winter, in a man aged fifty-four years. The illustration was taken in May, 1917. For several years the patient had suffered during the cold winter months from severe acrocyanosis and a chilblainy condition of the hands (but not of the feet), with the formation of painful cracks and fissures on the fingers. During the winter of 1917 he suffered, in addition, from a good deal of hyperkeratosis of the hands and lower limbs; in the latter situation the hyperkeratosis was partly follicular, and the skin just above the ankles became rough with spinulous projections like a nutmeg-grater, and also showed a good deal of darkening from "epidermic pigmentation." This all passed off, together with the acrocyanosis of the hands, on the rather sudden commencement of the hot summer weather.

It should be noted that in extreme examples of Beau's lines, instead of mere transverse grooving, there may be a complete break in the growth of some of the affected nails. This happened in the case of one of H. French's out-patients at Guy's Hospital, a man, aged forty years, who had severe lobar pneumonia in June, 1912, and whose hands were photographed some months afterward to illustrate the appearance in question.[61] A. Vogel,[62] however, remarked that neither he nor his colleagues had ever observed complete falling off of the nails after typhoid fever, such as had been recorded by older writers on the subject. In some cases, due to local causes, transverse grooving or transverse breaks in the growth of nails may be associated, naturally enough, with more or less local ecchymosis.

INCURVED NAILS WITH CLUBBED FINGERS (BOTH BILATERAL AND UNILATERAL CASES)

Incurved nails in wasting diseases need not be associated with clubbing of the finger-tips, but clubbing of the finger-tips (*Doigt en*

[61] *Guy's Hospital Gazette*, London, 1912, vol. xxvi, p. 476 (illustration).
[62] A. Vogel, *Deut. Arch. f. klin. Med.*, Leipzig, 1870, vol. vii, p. 338.

Digitized by Google

baguette de tambour, Trommelschlägelfinger) is always associated with more or less incurving or aduncation (*aduncus-hooked*) of the nails. The condition is frequently, but by no means always, accompanied by clubbing of the toes; but in such cases the clubbing in the toes is generally less marked than in the fingers. The causes of the clubbing are still not completely understood, but toxic conditions connected with suppuration, etc., and chronic venous congestion and cyanosis (local or general), play important parts in the pathogeny. The condition is frequently present in chronic diseases of the lungs and heart associated with much cyanosis, notably, and in an extreme degree, in connection with congenital heart-disease and cyanosis, when such "blue children" survive their earliest infancy—and from what I have seen I would say that these blue children live to adult age more often than is generally supposed.

A somewhat acute development of clubbed fingers is occasionally observed in pulmonary and other intrathoracic diseases associated with suppuration, such as bronchiectasis, empyema, and pulmonary abscess (possibly also mediastinal abscess), which need not be accompanied by any considerable cyanosis.

In certain cases clubbing of the fingers marks an early stage in the development of Pierre Marie's syndrome of "pulmonary hypertrophic osteo-arthropathy" (perhaps better termed, "secondary osteo-arthropathy"), and every genuine example of the latter condition shows likewise typical clubbing of the finger-tips with incurved nails.[63]

Samuel West,[64] A. Dennig,[65] and Erich Ebstein[66] have made careful studies of the subject of clubbed fingers and, besides their own cases, have quoted many earlier observations by other writers. The condition may certainly disappear almost as readily as it arises when it is connected with some curable suppurative condition in the

[63] Cf. also J. F. Alexander, "Hypertrophic Pulmonary Osteo-arthropathy," *St. Bartholomew's Hospital Reports*, London, 1906, vol. xlii, pp. 41–79; and Sir Dyce Duckworth, *Ibid.*, 1908, vol. xliv, p. 6.

[64] Samuel West, *Trans. Clinical Society of London*, 1897, vol. xxx, pp. 60–64; also "Diseases of the Organs of Respiration," London, first edition, 1902, pp. 488–491.

[65] A. Dennig, *Muenchener med. Wochenschr.*, 1901, xlviii, p. 380.

[66] E. Ebstein, *Deut. Arch. f. klin. Med.*, Leipzig, 1907, vol. lxxxix, pp. 67–112; and *Mitteilungen aus den Grenzgebieten d. Med. u. Chir.*, Jena, 1911, vol. xxii, pp. 311–322.

Digitized by Google

thorax. Thus, West related the case of a gentleman, aged thirty-six years, with right-sided empyema between the base of the lung and the diaphragm. He was ill for about three weeks before the pus was found. Three weeks later the fingers became clubbed, and within a fortnight the clubbing was well marked, but did not affect the toes. He recovered from the empyema, and by the end of three months the clubbing had completely vanished. In the discussion on this case Sir R. J. Godlee likewise maintained that clubbing of the fingers, *however chronic,* might disappear if the disease on which it depended were cured. He mentioned that he had himself observed a case associated with empyema in which the clubbing of the fingers disappeared within eight weeks of the evacuation of the pus. Béclère, of Paris, observed the almost complete disappearance of clubbing in the fingers of a boy, aged seven and one-half years, after the cure by operation of an empyema.[67] According to H. Batty Shaw,[68] Moizard,[69] and A. Orillard[70] have also recorded the diminution or disappearance of the clubbing after cure of empyema. In a patient, aged thirty-two years, F. Lacher removed a drainage-tube from an old empyema sinus, left there from the time of the operation ten years previously. Diminution in the size of the clubbed finger-tips followed removal of the tube.[71] Disappearance or diminution of the clubbing was also noted in some of the cases alluded to further on (Sir Thomas Smith, Sir William Church, Mangelsdorf).

In regard to the occasional rapid development of clubbed fingers, West, besides his own case in which the clubbing became well marked in less than a fortnight, referred to Wunderlich's case,[72] in which it developed in five weeks. E. Ebstein has quoted R. Saundby in regard to its appearance in a single week. Trousseau[73] stated that with rapid onset of the clubbing there might be local pain. In

[67] Béclère's case in question is described in E. Meygret's Paris thesis (No. 54 of the year 1905), *La Pathogénie du Doigt Hippocratique* (p. 16).

[68] See reference further on to Batty Shaw's work.

[69] Moizard, *Bull. Soc. Méd. des Hôpitaux de Paris,* 1893, Sér. 3, vol. x, p. 359 (paper on secondary osteo-arthropathy).

[70] A. Orillard, *Gazette des Hôpitaux,* Paris, 1892, vol. 65, p. 685 (paper on secondary osteo-arthropathy).

[71] F. Lacher, *Muenchener med. Wochenschrift,* 1901, xlviii, p. 544.

[72] C. A. Wunderlich, *Arch d. Heilkunde,* Leipzig, 1860, vol. i, p. 297.

[73] Trousseau, "Lectures on Clinical Medicine," English translation, New Sydenham Society, London, 1870, vol. iii, p. 306.

Digitized by Google

Mangelsdorf's case (mentioned further on) the clubbing was accompanied by lividity, pains, and numbness in the finger-tips. In the case of a boy, L. P., aged ten years, now in the hospital under my care, with old rheumatic valvular disease and great dilatation of the heart (without obvious cyanosis), the fingers are becoming clubbed, and the process is accompanied by local redness of the finger-tips, but not apparently by pain, tingling, or any paræsthesia.

Among the rarer causes of clubbing of the fingers West mentioned a unique case recorded by Sir Thomas Smith [74] in which it seemed to be due to acute pneumonia. In this case it should be observed that the clubbing developed rapidly and disappeared almost as rapidly during convalescence, and a similar course of events was observed in a case (Sir William Church) of pulmonary abscess.[75] West also instanced its association with chronic suppurative hip-joint disease (Sir Thomas Smith [76]), and portal cirrhosis of the liver (Flückiger [77]). Its occasional connection with certain forms of biliary cirrhosis of the liver has been emphasized by Gilbert and Lereboullet.[78] H. D. Rolleston [79] refers to its occurrence not only in biliary cirrhosis of the liver (Gilbert and Lereboullet, Gilbert and Fournier, Sir Frederick Taylor, Boutron, Roger Smith, Parmentier and Castaigne, Rhorassandri, E. Ebstein) and (exceptionally) in ordinary portal cirrhosis (Flückiger, Bouchard, Rolleston), but also in delayed ("late") inherited syphilitic disease of the liver, in hydatid disease of the liver (Girard), and in association with amyloid (lardaceous) liver (H. E. Symes-Thompson). In the last case and in a case of portal cirrhosis of the liver (F. Obermayer [80]) the clubbing of the fingers was said to have been accompanied by Pierre Marie's osteo-arthropathy.

Clubbing of the fingers may, as one would expect, occur in association with mediastinal abscesses (Osler). I have already men-

[74] Smith, *Trans. Path. Soc. Lond.*, 1872, vol. xxiii, p. 79.

[75] Quoted by Sir Thomas Smith, *loc. cit.*, p. 79.

[76] Smith, *Ibid.*, p. 79.

[77] M. Flückiger, *Wiener med. Wochenschr.*, 1884, xxxiv, p. 1457.

[78] Cf. P. Lereboullet, "Les Cirrhoses Biliaires," Paris, 1902.

[79] H. D. Rolleston, "Diseases of the Liver," Second edition, London, 1912, pp. 229, 320, 380 (Fig. 49), 405, 437.

[80] F. Obermayer, "Knochenveränderungen bei chronischem Icterus," *Wiener klin. Rundschau*, 1897, xi, p. 625.

Digitized by Google

tioned one instance of its association with pulmonary abscess (Church), and further on I shall allude to another instance (C. Gerhardt). H. Batty Shaw [81] refers to the appearance of clubbing of the fingers, with or without definite signs of Pierre Marie's "secondary osteo-arthropathy," in isolated cases of various diseases, including rare conditions of so-called chronic "enterogenous cyanosis"—in which some of the hæmoglobin of the red blood-cells is converted into sulphæmoglobin or methæmoglobin (Stokvis and Hijmans Van den Bergh), cicatricial pyloric obstruction, pyelonephritis and cystitis, carcinoma of the œsophagus, leprosy, rickets, malarial cachexia, and erythræmia (splenomegalic polycythæmia). An instance of clubbing of the fingers associated with purpura was recorded by Mangelsdorf.[82] After some weeks' illness both wrist-joints became swollen and painful and the fingers began to get clubbed—the development of the clubbing being accompanied by lividity, pains, and numbness in the finger-tips. The patient ultimately recovered and the clubbing also gradually (in about three months) disappeared.

Occasionally no cause could be found for the occurrence of the clubbing.[83] Thus, West [84] mentioned the case of a woman, aged fifty years, who came under treatment because she had swallowed some ammonia by mistake. Both her fingers and toes were clubbed. No cause could be found for the clubbing, which had apparently commenced three to four weeks previously. West likewise recorded clubbing of fingers and toes in an otherwise apparently healthy medical man, aged thirty-eight years. In a third case West could find no cause; though the patient, a man, aged thirty-five years, had had pleurisy five years previously, no trace of this could be detected. In August, 1897, I saw a man, aged forty-six years, who had had typical clubbing of all his fingers (not his toes) ever since he could remember. I could find no cause for the clubbing. He had psoriasis, but it was of more recent date than the clubbing. This

[81] H. Batty Shaw, in Allbutt and Rolleston's "System of Medicine," Second edition, 1907, vol. iii, p. 66; Cf. T. C. Janeway, *Amer. Journ. Med. Sci.*, Philadelphia, 1903, vol. 126, p. 563.

[82] Mangelsdorf *Wiener med. Wochenschr.*, 1885, vol. xxxv, p. 362.

[83] Cf. several references given by H. Batty Shaw, *loc. cit.*, p. 69.

[84] S. West, *loc. cit.*

Digitized by Google

reminds me that von Eiselsberg[85] has described a congenital and familial condition of the terminal phalanges, resembling clubbed fingers in appearance, and affecting the patient (a man aged thirty-five years), one of his grandfathers, one uncle, and one sister. Eiselsberg regarded the condition as probably of lymphangiomatous nature.

Very curious are the *examples of unilateral clubbing of the fingers.* Most of them are due to syphilitic aneurismal formation in the aorta or its branches to the upper extremities; and treatment of the aneurism has been known to be followed by diminution of the clubbing (Sir Thomas Smith, and J. Hatiegan—see further on). Even these data fail to furnish us with any quite satisfactory pathologic and etiologic explanation—that is to say, a theory applicable to every case of clubbed fingers. But it is quite certain that local blood-stasis and venous congestion generally play an important part in the pathogeny. I shall now shortly refer to various published accounts illustrating the unilateral or asymmetrical occurrence of clubbed fingers, and it will be seen that in one case (Klauser's case) an unreduced dislocation of the shoulder-joint had the same effect on the fingers as an aneurism had in other cases; asymmetrical clubbing of the fingers (one side more affected than the other) has certainly been observed apart from aneurism.

Sir Thomas Smith[86] recorded a case of aneurism of the right axillary artery, probably pressing on the veins and nerves. There was pain in the right arm and hand, and the fingers were œdematous and markedly clubbed. The patient lived only twenty days after ligature of the right subclavian artery (dying of pyæmia), but during that short time the clubbing of the fingers almost entirely disappeared.

One of the first cases recorded (if not actually the earliest) of unilateral clubbing of the fingers was that of J. W. Ogle,[87] in 1858. The clubbing affected the fingers of the right hand and was associated with œdema and cyanosis and absence of the right radial pulse; there was a large aneurism of the right subclavian artery and the aorta. The account of the case was illustrated.

---

[85] Eiselsberg, *K. k. Gersellsch. der Aerzte*, Vienna, June 16, 1911 (*Muenchener med. Wochenschr.*, 1911, lviii, p. 1591).

[86] Smith, *Trans. Path. Soc. Lond.*, 1872, vol. xxiii, p. 74.

[87] Ogle, *Trans. Path. Soc. London*, 1858, vol. x, p. 103.

Digitized by Google

Canton's case (1865) of unilateral clubbing of the fingers of the right hand was likewise due to a subclavian aneurism on the same side.[88]

Sir William Osler[89] mentions unilateral clubbing of fingers in two cases of intrathoracic aneurism under his care, in neither of which were there any special signs of venous engorgement.

Béclère,[90] in 1901, demonstrated a man, aged sixty-five years, with right subclavian aneurism and unilateral clubbing of the fingers on the same side. E. Meygret,[91] in his Paris thesis of 1905, described this case (with figure), and also other cases illustrating the pathogeny of clubbed fingers. One of these patients was a man, aged sixty-six years, in whom the return of the venous blood was hindered in both upper extremities, but more on the right side than the left; the clubbing of the fingers was more marked in the right hand than in the left, and he had paralysis of the right vocal cord.[92] Such asymmetrical cases of clubbed fingers serve to illustrate the subject of unilateral clubbing, and E. Ebstein[93] refers to two other instances of his asymmetry; one was a case of pulmonary abscess seen by himself; the other was a case of mediastinal new-growth observed by C. Gerhardt,[94] in which the clubbing was much greater in the right-hand fingers than the left, and was accompanied by swelling of the right arm. In this connection it may be added that John Gay[95] described a case, in 1871, in which bilateral subclavian aneurisms were associated with bilateral clubbing of the fingers.

Jean Baur,[96] at the Société Anatomique of Paris (1910), showed a case of unilateral left-sided clubbing connected with left subclavian aneurism in a man aged sixty-one years.

---

[88] Canton, *Trans. Path. Soc. Lond.*, 1865, vol. xvii, p. 428.

[89] Osler, "Principles of Medicine," Eighth edition, 1912, p. 855.

[90] Béclère, *Société Médicale des Hôpitaux de Paris*, Séance de 22. Mars, 1901.

[91] Meygret, "La Pathogénie du Doigt Hippocratique," Paris, 1905 (*Paris Medical Thesis*, No. 54 of the year 1905, p. 31).

[92] Meygret, *op. cit.*, p. 35, Case V, plate iii.

[93] E. Ebstein, *Mitteil. a. d. Grenzgebieten*, Jena, 1911, vol. xx, p. 317.

[94] C. Gerhardt, *Die Hand des Kranken, Volkmann's Sammlung klinischer Vorträge*, New Series, No. 231, Leipzig, 1898, p. 1201.

[95] J. Gay, *Trans. Path. Soc. Lond.*, 1871, vol. xxii, p. 111.

[96] J. Baur, *Société Anatomique de Paris*, Séance de 22. April, 1910. For a detailed account see *Revue de Médecine*, Paris, 1910, xxx, pp. 993–998 (with illustrations).

Digitized by Google

P. Marie and Béhague[97] demonstrated a man with subclavian aneurism and unilateral clubbing of the fingers on the same side.

W. Berent[98] narrated the case of a coachman, aged fifty-six years, with aneurism of the left subclavian artery and unilateral clubbing of the fingers of that side.

Theo. Groedel[99] described the case of a man, aged forty-seven years, with clubbing of the fingers of the left hand and aneurism of the arch of the aorta.

M. Bernhardt[100] recorded the case of a cabinet-maker, aged sixty-two years, who suffered from an aneurism of the aorta (ascending portion and arch) and innominate artery, with clubbing of the fingers of the right hand. He had acquired syphilis thirty-eight years previously.

G. Joachim,[101] at a medical society in Königsberg (1908), demonstrated a patient with an aneurism of the thoracic aorta and clubbed fingers in the right hand. The first symptom was a kind of paræsthesia (formication) in the right hand and lower arm.

E. Ebstein[102] demonstrated a workman, aged forty-eight years, with right subclavian aneurism and clubbing of the fingers of the right hand.

J. Hatiegan[103] described a case of aneurism of the aortic arch and right subclavian artery with unilateral clubbing of the fingers on the right side. The patient was a man, aged forty-four years, who had acquired syphilis at the age of twenty-one years. Prolonged anti-syphilitic treatment (many months) was followed by great improvement, both in regard to the aneurism and the fingers. In fact, the clubbing of the fingers almost disappeared.

H. D. Rolleston and E. F. W. Grellier,[104] at the Royal Society

---

[97] P. Marie and Béhague, *Société de Neurologie*, Paris, Séance de 3. Mai, 1917.

[98] W. Berent, *Berliner klin. Wochenschrift*, 1903, xl, pp. 75–79.

[99] Groedel, *Muenchener med. Wochenschrift*, 1906, liii, p. 264; and 1907, liv, p. 216.

[100] Bernhardt, *Berliner klin. Wochenschrift*, 1906, xliii, p. 343.

[101] Joachim, *Berliner klin. Wochenschrift*, 1908, xlv, p. 2208.

[102] Erich Ebstein, *Med Gesselschaft su Leipsig*, June 7, 1910 (*Berliner klin. Wochenschrift*, 1910, xlvii, p. 1560); for fuller account see E. Ebstein, *Mitteilungen a. d. Grenzgebieten*, Jena, 1911, vol. xxii, p. 312.

[103] Hatiegan, *Wiener klin. Wochenschrift*, 1916, xxix, p. 706.

[104] Rolleston and Grellier, *Proc. Roy. Soc. Med., Clinical Section*, London, 1914, vol. vii, p. 13.

Digitized by Google

of Medicine, showed a laborer, aged sixty-three years, who had unilateral clubbing of the fingers (left hand) connected with a left axillary aneurism. His blood-serum gave a strongly positive Wassermann reaction. The circulation in the left arm was so good that Rolleston and Grellier doubted whether the clubbing could be referred to venous stasis.

Klauser [105] recorded the case of a woman, aged fifty-five years, with clubbing of the fingers of the right hand as a result of a dislocation of the right shoulder-joint of five months' duration. The displaced head of the humerus was between the subcoracoid and subglenoid positions. The result of this displacement was, in regard to the effect on the fingers, similar to that of the pressure of a subclavian aneurism.

CONGENITAL INGROWING NAILS

Some years ago I saw a man whose finger-nails were quite narrow in proportion to the breadth of his fingers, so that there were regular pads of flesh at the sides of the finger-nails. This peculiarity, however, caused him no inconvenience, and doubtless dated from early life or birth. The man had, in fact, what may be termed "congenital ingrowing finger-nails," but these were not, of course, associated with the secondary inflammation or ulceration, the appearance of which is usually the first reason why sufferers from ingrowing toe-nails seek professional assistance. In some cases, doubtless ingrowing toe-nails are of congenital origin,[106] and the appearance of secondary inflammation and ulceration is due to the effects of pressure, friction, abnormal moisture, badly-fitting boots and shoes, etc., acting on the congenital abnormality in question.

---

[105] Klauser, *Muenchener med. Wochenschrift*, 1912, lix, p. 929.

[106] Cf. T. W. Parry, "Congenital Ingrowing Toe-nails," *Lancet*, London, 1899, vol. ii, p. 1016.

Digitized by Google

Neurology

THE CRIMINAL MIND

BY LOUIS E. BISCH, A.B., M.D., Ph.D.

Formerly Director, Psychopathic Laboratory, New York Police Department; Associate in Educational Psychology, Columbia University; Visiting Neurologist, New York City Children's Hospital and Schools

NOT so many years ago psychology was looked upon as a "high-brow" subject, very interesting to muse over and theorize about within the cloistered walls of a university, but possessing no direct relationship to everyday affairs of life. But of late experiment and actual demonstration have changed all this. Mental development is being measured and linked with mathematics, elusive thought processes are being made objective studies, tests to determine an individual's fitness for this or that vocation are being worked out, and even in the realm of business the "Psychology of Advertising" has already firmly established itself.

The same advance in practical application may be claimed for abnormal psychology—that branch of the science of the mind which deals with the insane and the feeble-minded. Through its influence such persons are no longer considered hopeless degenerates who might better be dead, but rather they are viewed as human beings with diseased minds or with brains that never developed to normal, and who deserve hospital or institutional treatment just as much as does a person who contracts typhoid fever or any other infectious disease.

Time was when the poor unfortunate who developed an insanity was thrown into a padded cell and beaten into submission, if necessary. Nowadays our hospitals for the insane are up-to-date in every way, and medical attention is an indispensable routine. The cell and rubber hose have given way to the hospital ward and continuous bath. "Once insane, always insane" stands no longer as a bugaboo. About 50 per cent. of the New York State Hospital patients are discharged annually as recovered, while about 35 per cent. return to their homes

Digitized by Google

improved. So far as the feeble-minded go, the same enlightened opinion is making itself felt throughout the country.

Somewhat more recently science has turned its attention to the criminal mind. Experimental studies have been conducted in various prisons and reformatories, and everywhere the results have been striking.

In every institution where examinations have been made it has been found that a certain percentage of the inmates are feeble-minded or insane, and the figures run all the way from 20 per cent. to 80 per cent. of the prison population. Most of the studies have been made upon juvenile offenders, but the same holds true of adults as well.

Just consider what this means! A feeble-minded person is one who is born with a brain that is defective in one way or another, in consequence of which he will never develop to normality nor will he ever be able to compete on equal terms with his normal fellows. An insane person is born with a normal brain, but something happens in the course of his life to disturb his thinking mechanism—his mind becomes diseased—and he may or may not be restored to normal again, depending largely upon the care he receives. In either case, whether it be feeble-mindedness or insanity, the mind—the controlling organ of the body—is affected. Is it fair, wise, or humane to treat such individuals in the same manner or according to the same standards that society employs for persons of normal mentality? Would we knowingly throw an eight- or ten-year-old child into prison for a term of years or dole out the same punishment to a sick man? Yet in effect this is exactly what is happening every day. And we are overcrowding our jails, prisons, reformatories, and almshouses with just this sort of material.

The question of legal responsibility for crime committed has frequently been a very puzzling one, and the courts have struggled with it for many years. That emotion plays an important rôle in the perpetration of offences against the person as well as against property is generally recognized and considered at the time of trial in fixing responsibility, but only in comparatively few cases and during recent years has the question of the mental capacity of the offender to distinguish between right and wrong been taken into account. Yet it is obvious that since the brain produces our thoughts and dominates our actions, and since every form of activity is the product of a mental

Digitized by Google

process, no crime should ever be judged unless the degree and state of mentality at the time of perpetration of the offence is also studied.

A feeble-minded or insane person does not think like a normal; he does not act like a normal; his emotions are not those of a normal; his code of morals is unlike that of the normal; his sense of right, wrong, and justice is peculiar to himself or to that of a similar state of mind. Are such individuals responsible and are they to be judged by the same standards that have been set up by and for the majority of the population who possess the mental faculties to the full that these unfortunates are deficient in?

A feeble-minded person will always remain feeble-minded. An insane person may be improved or cured, but only under proper treatment. Prison bars will help neither—they may even make them worse. Yet we have been and still are throwing these individuals into jails instead of hospitals, are keeping them there for a number of months or years, sooner or later letting them loose upon society once again, only to re-arrest, re-try, and re-imprison—thus keeping the farce a-going for as long as the life of a convict will span it. We are slowly beginning to realize that our prison treatment of normal criminals is unscientific and does not make for reform. How much more manifestly unwise is the folly pursued in regard to defective and diseased minds!

Beginning January 1, 1916, New York City conducted an experiment on the criminal mind that is noteworthy. Studies made before that time had usually been carried on in prisons and reformatories after the conviction of the offender, and the subjects necessarily were a rather selected group. This gave no very suggestive data as to the character of the minds of persons committing petty offences, etc., nor as to the extent of mental abnormalities among the large number of persons who are arrested daily in a metropolitan city. Then, again, previous studies gave no idea of the persons who are suffering from insanity to a mild degree or who are border-line cases of feeble-mindedness and usually escape diagnosis.

The studies were inaugurated by Police Commissioner Woods after preliminary experiments had been made. A so-called Psychopathic Laboratory was installed at police headquarters, a director and staff were appointed, and the necessary scientific equipment set up.

During the preliminary investigation it was estimated roughly

Digitized by Google

that about 5 per cent. of persons arrested daily in Greater New York are suffering from some form of mental abnormality rendering them more or less irresponsible. Since there are, on an average, 600 persons apprehended by the police each day, it follows that some 30 persons should be entitled to an examination and estimate of their mental status daily—a total of over 10,000 a year. This does not mean, of course, that there are 10,000 feeble-minded and insane arrested yearly in New York. The figures give simply a very general idea of the number of persons breaking the laws who probably are suffering from some degree of mental irresponsibility. Besides feeble-mindedness and insanity, many border-line cases—persons almost normal—were found, and the results also showed that alcoholism, addiction to habit-forming drugs, such as heroin, cocaine, and morphine, as well as venereal disease, were most important factors in the commission of crime. Furthermore, many individuals were only temporarily impaired mentally, and proper hospital treatment would have restored a considerable percentage to normal.

During the first six months 450 prisoners were examined, and of this number only 205 were found to be normal. Of the remaining number, 74 were definitely feeble-minded, 62 suffered from some form of insanity, 46 were decidedly inferior individuals who needed some sort of supervision if permanent rehabilitation were to be hoped for, 21 had venereal disease which affected their minds, 11 were addicted to habit-forming drugs, 8 were chronic alcoholics, 11 suffered from some form of sex perversion, 6 were epileptics, 4 had a functional nervous disease rendering them mentally unstable at times, while one had pulmonary tuberculosis.

It is to be noted that about 50 per cent. of the prisoners examined were found to be abnormal mentally, but the reason for this high percentage is due to the fact that the cases were selected in such a way that only those who were suspected of being abnormal were put through the routine method of examination.

This routine method of examination was as follows: Each morning the director selected from the police "line-up" those individuals who seemed proper cases for examination. The line-up is composed of prisoners who have a record and have committed felonies. So far as misdemeanants are concerned—those not candidates for the line-up—the various desk lieutenants in the precincts throughout the city

Digitized by Google

occasionally sent cases whenever the nature of the crime suggested weak-mindedness or disease. Besides, the magistrates and the courts of special and general sessions sent cases to the laboratory. A number of "cranks" who were in the habit of visiting various city departments making nonsensical complaints to officials and who seemed to be irrational were also examined.

An attempt was always made to make the prisoner feel as much at home as possible, and he was then first examined by means of so-called "psychological tests." Among these may be mentioned general intellectual tests, association tests, imagination tests, attention tests, pedagogical tests, memory tests, reasoning tests, moral and emotional tests, etc. The tests employed varied in each case, and from a selection of about 30 those were chosen which seemed best suited to the case in hand. Both tests involving language and tests involving motor manipulation were used. Among the latter are the so-called "form-board tests," which, in the main, consist in placing irregularly shaped pieces of wood in a frame according to a certain pattern. Whenever a foreigner was examined an interpreter was employed.

It can not be emphasized too strongly that failure in any one or more of the tests does not necessarily mean that a person is suffering from mental defect. The manner in which a subject reacts is even more important than what he actually does, and scientific interpretation, which can only be accurate if based upon long experience, is absolutely necessary.

After the psychological tests the prisoner was again examined from other viewpoints and a physical examination was always made. In addition, his general reactions at the time of arrest and the possible motives involved in the offence were taken into consideration when evaluating his mentality. On several occasions it became necessary to ask the judge to remand the prisoner for a few days so that additional information might be obtained from the immediate family, and of the birth conditions, early development, school period, and general mental make-up studied. A special investigator who had had years of experience in looking up family histories was employed, and in many cases he went directly to the homes in order to obtain first-hand information. Great care was always exercised to avoid hasty conclusions, and a report of the findings resulting from the examina-

Digitized by Google

tion of the prisoner was only sent to the presiding judge when no doubt existed as to the diagnosis.

In this way, before passing sentence upon a prisoner, the judge had before him not only evidence concerning the commission of a crime, but also evidence in regard to the mental calibre, efficiency, capacity, and responsibility of the prisoner arraigned. In many cases, due to this first examination and report, prisoners were sent to hospitals for the insane and institutions for the feeble-minded when under the previous and usual routine they might have gone direct to prison. Many more of the feeble-minded type would have been committed to a proper institution had such an one existed. At the present time the need for such special institutions for feeble-minded criminals is a great necessity in all states, and the work of the Psychopathic Laboratory clearly demonstrated this need.

It must be remembered that all criminals are not abnormal mentally, and that probably a great majority are possessed of normal mental faculties. It is really incorrect to label a feeble-minded or insane person as criminal. It would be better to say that he is "uncriminal" or "unmoral," because his mind is dwarfed or diseased to such a degree that ordinary moral standards are not appreciated.

Furthermore, there is a great difference between the person who breaks the law unknowingly or who commits a crime for the first time, due to uncontrollable emotion, and the person who repeats crime after crime despite imprisonment and efforts at reform or who deliberately enters upon a career of crime as a profession. The first type possesses, as a rule, none of the definite traits of the habitual criminal, nor does he develop that fixed and stereotyped attitude towards society so common among repeated offenders. These persons are really "pseudo-criminals," or perhaps it would be more scientific to call them "pseudo-moral deviates." Remorse for an offence frequently drives them to surrender to the police voluntarily. On the other hand, the habitual criminal, when possessed of normal intellectual endowment, may believe either that society has wronged him or that society owes him a living, and therefore he may intentionally choose a career of crime just as another might a trade. Burglars are often found in the former group and pickpockets in the latter. Such individuals seldom consider the consequences of their acts, they suffer no pangs of conscience, and that a robbery or theft may

Digitized by Google

deprive some poor person of hard-earned savings or plunge an entire family into distress does not elicit any sympathetic response.

Among the many interesting cases examined at the Psychopathic Laboratory are the following:

A man of forty-five was arrested for sending in a false alarm of fire. To the casual observer he would have passed for normal—or perhaps as a very dull or slightly intoxicated individual. Examination at the laboratory revealed that he was suffering from "paresis" or "softening of the brain"—a chronic, progressive mental disease that invariably leads to dementia. A letter was sent to the presiding judge, and the man was committed to a hospital instead of to prison.

Another somewhat similar case was that of a young man who admitted sending in a great many false fire alarms. He also admitted setting fire to about a dozen buildings. Special investigation showed that he had been reared among refined surroundings and had enjoyed the advantages of continuous education. In many respects he gave the appearance of being merely a mischievous but normal boy. As a matter of fact, he was rapidly developing an insanity which, if not properly treated, would soon render him a hopeless dement. He, too, was sent to a hospital for mental diseases.

A man who had had several prison residences was found to be suffering from epilepsy, heroin addiction, lead poisoning, and a venereal blood disease. There was also a marked depression in the skull, due to a bullet wound sustained five years previously. The prisoner's mental deterioration was marked!

In July, 1915, a boy was arrested for entering an apartment through a window from the fire-escape while the occupant, a woman, was within. He was sentenced to a reformatory for the second time, his first offence being habitual truancy. Four days after receiving his parole he was told by another to assault and rob his employer. As is characteristic of individuals of this type, he obeyed willingly in spite of the fact that the employer had befriended him and there was no apparent motive for committing such a deed. Although actually twenty years old, the boy's mental age by the tests was only 6.6 years! The actual productions of this boy are interesting because so typical of the naïve childishness of the imbecile group of feeble-mindedness. When asked what happened, he replied with a bland smile, "I went out delivering for the boss and X followed

Digitized by Google

me to the house. He went in the store and asked for Mr. Z to show him a suit of clothes. He took a revolver out of his pocket and gave it to me. He told me to hold Mr. Z, and he made me hit him and then he would take a suit. He was hit upstairs, and you can see the blood on the carpet where he fell." When questioned further why he had struck his employer he said, "I know it was wrong. I know I shouldn't do what other people tell me to do, but I done it. X told me to do it. He held his hands and I hit him three times. I would like to work for Mr. Z again."

Digitized by Google

THE THERAPEUTIC USE OF OCCUPATION IN THE TREATMENT OF THE INSANE

BY JOHN P. H. MURPHY, M.D.

Assistant Physician, St. Elizabeth's Hospital, Washington, D. C.

If one would attempt a study of human behavior in all its varying moods, noting the diverse reactions of different individuals to certain happenings and events, especially those which are of personal interest, he will perhaps, after making a rather careful survey of both ancient and modern history, arrive at the conclusion that man, in no matter what phase of his existence, is, figuratively speaking, "tarred with the same brush." This may be true so far as it goes, but, as it is difficult to find two dispositions which are exactly alike under all conditions, it would appear that this criterion does not hold in every case.

We are all more or less familiar with the national characteristics of certain races, which brand them as a class, and many of us are able to recognize certain types, by their accent, mannerisms, and dialect, as natives of different parts of the same country; yet each has his or her distinct identity, individuality, which distinguishes the personality from all others; we may copy the original, we can not reproduce it.

In looking over the pages of the past we are impressed by the attitude of the ancients toward life, their methods, customs, religion, and national spirit, which, under the direction of chosen minds, was instrumental in bringing about the upbuilding or the downfall of the people. Let us, for example, dwell for a time upon the life history of some of the more prominent types whose works of art and writings alone remain as memorials to the deeds of other days.

Of the thirty-one dynasties of ancient Egypt, there were many Pharaohs, from Suphis I, the Cheops of the Greeks, builder of the Great Pyramid, the largest of the Gizeh group, to Necho II, who, coming into collision with the Babylonian king Nabopolassar, met defeat from the armies of this monarch, led by his son Nebuchadnez-

Digitized by Google

zar, yet, while Egypt as a power is dead, the memory of her greatness lives among us to-day in priceless relics of antiquity.

Under the reign of Amenemhat III, Egyptian civilization reached the highest perfection to which it ever attained. The celebrated reservoir, known to the classic writers as Lake Moëris, and the mysterious labyrinth, which Herodotus thought to surpass even the Pyramids, are supposed to be the result of his engineering skill. The names of Thothmes III, "The Alexander of Egyptian history," whose architectural works in the valley of the Nile were almost numberless, and of Rameses II, most renowned monarch of the nineteenth dynasty, whose deeds of conquest have been the theme of many ancient tales, still echo through the mist of twilight centuries resurrected by the scholar and modern Egyptologist.

In a summary of the accomplishments of this bygone race, we are amazed at the labor, perseverance, and undaunted spirit of endeavor which built up an empire the splendor of which has yet to be surpassed. The spirit of conquest was merely one of the features of human ambition to reach the zenith of worldly glory, power, and success; and to this end the division of society into three distinct orders—priests, soldiers, and common people—seemed to have been the most natural solution. Religion was then, as it is to-day, a necessity; for, even if only the chosen few initiates of the sacerdotal order were familiar with the central doctrine of the unity of God, the mysteries of Osiris, Isis, and Horus, together with elaborate ceremonials and animal worship, were sufficient to keep the general public in a constant state of superstitious awe, symbolizing the powerful, the incomprehensible, the unknown.

In many of the arts and crafts the Egyptians attained a remarkable degree of perfection. The Pyramids, constituting one of the seven wonders of the world, almost all of which were erected before the twelfth dynasty, together with Sphinxes, the largest of which lies at the base of the Great Pyramid, are not only symbolic of power and intelligence, the combine of which the figures would seem to portray, but they voice, as it were, the ideals of humanity as it existed in those times. The remarkable skill of the artisans who produced artificial gems, scarabæi, and coffins of glass showed a knowledge of mechanical science only recently attained by the modern. "Thebes," says one writer, "in spite of all the ravages of time and

Digitized by Google

of the barbarian, still presents the grandest, the most prodigious assemblage of buildings ever erected by the hand of man." The ruins that cover the site of this ancient capital are the remains of palaces and temples erected by the combined labors of many of the Pharaohs and Ptolemies from as early as the twelfth dynasty to the Roman conquest. The temples of Karnak and of Luxor, so called from the native villages built within their ruined enclosures, the former being the work of seven kings and consuming more than five hundred years in the process of construction, are monuments indeed to the spirit of progress.

Passing from Egypt to Greece, it is not our place to dwell too much at length upon the romantic and the beautiful which linger in the atmosphere of the ancient sons of Hellas. Suffice to say that, though warlike by necessity, athletic by stature and choice, and fearless in conflict, as shown by the historian at the battle of Marathon and by Xenophon in the retreat of the ten thousand, they nevertheless presented an entirely different type from that displayed by the sons of Chemi.

Tracing their ancestry to the realms of legend, they believed themselves to be descended from a race of heroes of divine or semi-divine lineage. Teeming with myth and romance, imagination was inspired by the valiant deeds of the demi-god Heracles (Hercules), symbolizing the ideal of lofty moral qualities, heroism, self-sacrifice, and endurance possessed by the pioneers of Greek civilization.

The tale of the Argonauts in search of the Golden Fleece, and of Œdipus, who, warned by the oracle at Delphi not to return to Corinth, upon turning toward Thebes met and slew King Laius, his own father, only to solve the riddle of the Sphinx and marry the queen, widow Jocasta, his own mother, still speak to us in romance the myths of long ago.

Endowed, therefore, by nature with many higher thoughts and relieved of the common and more or less distasteful drudgery of labor by the institution of slavery, the artistic, the poetic, the philosophic, and the oratoric might be cultivated to the highest degree. Thus in Demosthenes, Homer, Euripides, Socrates, Plato, and Aristotle we are given examples of a mental plane which still remains to be copied, and the maxim "Know thyself" may prove of value even in this modern era. The Greeks were artists by nature, and it has been

Digitized by Google

expressed, "Ugliness gave them pain like a blow." The first maxim in Greek art was the same as that which formed the first principle of Greek morality—"Nothing in excess." Their temples were perfect in symmetry and proportion, and, whether the Doric, the Ionic, or Corinthian order, gave expression to a delicate sense of refinement and taste distinctly characteristic of Hellenic structures.

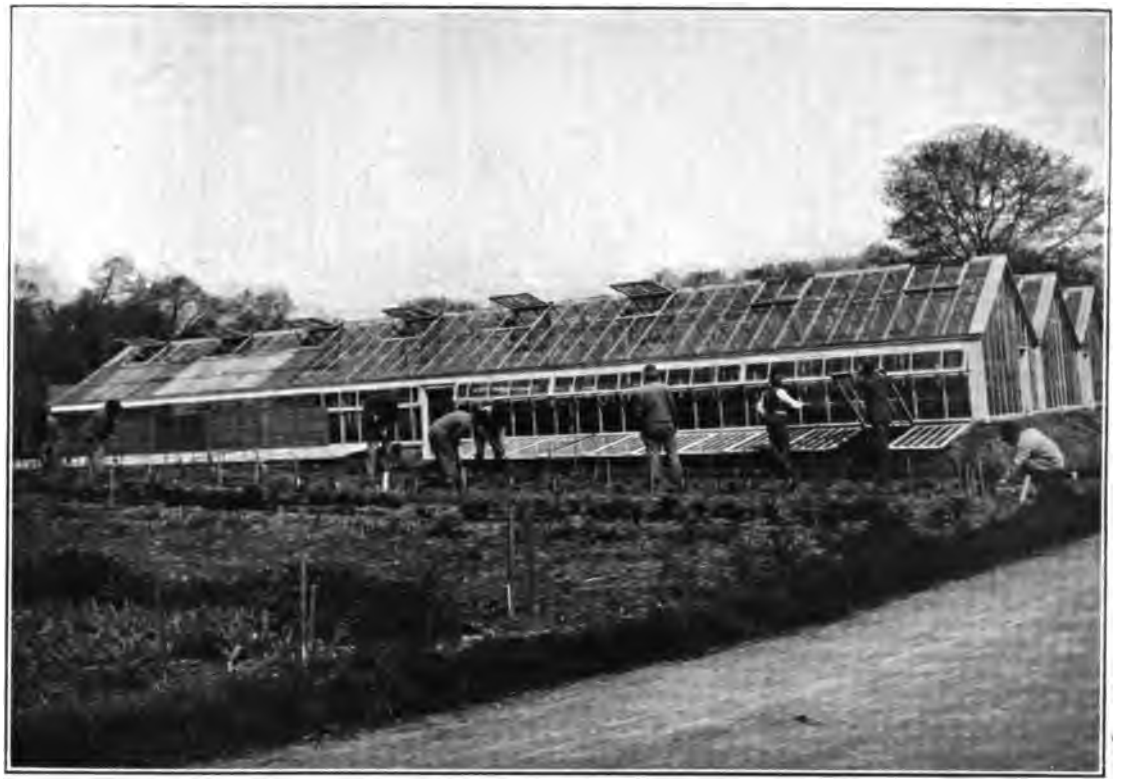
One might spend many interesting moments poring over the civilization of ancient Hellas, which, like a great pyramid whose top may be gilded with the light of intelligence, rests upon a base lying dark in the shadow of servitude.

But now let us turn to a different class. The Roman people, dating their ancestral origin to Romulus and Remus, whom tradition claimed to be the sons of the god Mars, were the builders of an empire which not only stands as the great central fact in the history of nations, but which, by its disruption, has laid the foundation for the modern nations of the world. The Latins were essentially a warlike and despotic race, and the types of personalities which at varying periods occupied the foreground in their national life-cycle, from the literary Cicero to the degenerated Nero, the historian Livy to the poet Virgil, were imbued with the public spirit of patriotism, tarnished by cruelty, and in later years by licentiousness and the indolent pride of too much success, which eventually led to their decay. The infamous and degraded emperor, Nero, who, casting aside the influence of the philosopher Seneca for the panderings of his freedman Tigellinus, who in his vanity had said, "Am I not a god?" and who, aside from his other crimes, set fire to the city of Rome, burning the Christians as torches in the arena in order to enjoy the spectacle, is an example of human decadence which marked the beginning of heathen disruption in the Eternal City.

As a final example of racial types I would mention the Hebrews, not only because of their marvellous tenacity in the face of inhuman and bigoted persecution, their skill in problems of financiering which has often placed a son of Israel at the pinnacle of economic success, but because they, above all people, have given to men the foundation of religion upon which has been built the civilization of the world. From tradition and sacred writings we learn that about eighteen or twenty centuries before our era a Semitic clan called the Abrahamic separated themselves from kindred tribes then dwelling near the head

Digitized by Google

Fig. 1



Horticultural work at St. Elizabeth's Hospital.

Digitized by Google

FIG. 2

A

B

Patients at St. Elizabeth's Hospital working in (*A*) brush shop, (*B*) laundry.

Digitized by Google

of the Persian Gulf and went in search of new abodes. Led by the patriarch Abraham and inspired by a faith in God Jehovah, they crossed the Mesopotamian plains and up into the country afterward known as Palestine. It would be needless to dwell upon the wanderings of the Jews throughout the earth from the time of their reception in Egypt, providentially prepared by Joseph, to our present day; suffice to say that by the birth of the founder of Christianity they have brought to pass one of the greatest, if not "the greatest," religious revolutions in the annals of time.

Having cited several of the more prominent examples of racial characteristics as exhibited by the ancients, I will now endeavor to portray a few of those elements which we term traits and which by their predominance in that intricate labyrinth which we call the personality produce that indescribable blend of coloring, the nature of man. How many are the varieties which we meet in everyday life, and how often are we surprised at some new manifestation of the hidden side which may force its way through the mask of diplomacy in moments when the censor is off his guard! Let us take as our first illustration "*the man of moods*"—to-day he smiles, is pleasant or, perhaps, even joculant; to-morrow he frowns and scowls when annoyed, assumes an air of sadness, or may even be bored by the greetings of his friends. Then there is the *sentimental person*—the one who acts when the sympathies are appealed to, and his opposite, the *cynic,* who becomes aggravated and peevish under the same conditions. Again, we have the *sensitive* creature whose feelings are so easily hurt by the merest trifle, and who becomes depressed, angry, or even hysterical at some unfortunate remark, probably uttered with no ill motive whatsoever. Then we have the *dreamer,* the visionary person, whose brain is so taken up with scientific or industrial pursuits that he may at times perhaps become almost oblivious to his surroundings, like the absent-minded professor who, engrossed in some deep, absorbing problem, bumps into a cow, raises his hat with a polite "Beg pardon," and passes on. Yet, on the other hand, his visions may be merely the air-castles and wishes of the impractical, or the deliberate, well-thought-out plans of the practical schemer. Next we have the *able man* whose education or ability in handling situations which necessitate good judgment and far-seeing forethought places him usually, circumstances permitting,

Digitized by Google

at the top of his profession, and he is dubbed by his friends as "A long-headed fellow," while again he may be blessed with the remarkable faculty "diplomacy," can smile coolly in the face of adversity, and serenely continue to further his purpose, setting aside, as far as possible, any obstacle which happens to cross his path. Suave and complacent, he may treat all alike, with that pleasant firmness of the "iron hand in the silken glove." Under the grip of self-control, his feelings are hidden by the veil of worldly wisdom. Let us take another example, *"the conceited individual"*; he is usually selfish, perhaps foolish in many ways, although it may often require a much stronger personality than his own to impress his shortcomings clearly upon his mind. He delights in exhibiting his talents before the public, loves to be flattered, and reminds one of a little verse written by Robert Burns concerning a certain gayly bedecked lady whom he happened to observe one day while at church, and who in her self-satisfaction was totally unconscious of a creeping thing which was endeavoring to navigate about her bonnet.

In this particular type we may observe a nature which is extremely touchy and sensitive as regards his own abilities, while, as is often the case, he may be gifted with that remarkable attribute which, to use a vulgar phrase, we call "a thick skin," whereby slurs and ridicule fail to reach the vital spot and glide from his conscience like water rolling off a duck's back.

Now we come to another sort of personality whom I will call the *man of leisure*. In depicting this character one must be guarded in his criticism lest he cast unwarranted and unjust reflection upon some of the noblest and most philanthropic minds. Some there are indeed who, having been born and reared in luxury and ease, develop an air of lofty superiority over their fellow-beings, decline utterly to associate with those outside their social set, and lead a life of pleasure with no definite purpose in view and which in the end often becomes a bore. Yet those there are from this same class who, though conscious of the wisdom of self-respect upon no matter what social plane, occupy their time to profit and good advantage in business, science, or the social atmosphere of their own firesides. I believe there is a saying that "Charity begins at home," and I venture to say that most of us may agree on this point. If the adage be true, therefore, the man who has amassed wealth lives to enjoy it in ease and comfort,

Digitized by Google

or who utilizes that to which he has fortunately fallen heir, to the advantage of himself and those dependent upon him, in a prudent and fruitful manner, is not to be criticised.

There is one failing in human nature, however, which must not necessarily be laid at the door of the man of leisure; this failing is *indolence.* We do not have to seek a rich man to find a *lazy* one. We can meet him in any walk of life, but yet this fault, like many others, is expressed in a variety of ways. There are some kinds of men who will do exactly what they are told and not a particle more. They believe it an imposition to be obliged to work a few minutes after the allotted time, and their main object, it would seem, is to get away from the job as soon as possible. Then there is a certain class who always labor under the idea that they are not getting paid what they are worth, and, although quite often there is a vital element of truth in their convictions, they are nevertheless the kind who are always ready to stir up trouble, and usually require the assistance of some higher mind upon whom they rely to accomplish their purpose.

Again, there are those who, ever ready to shirk the burden of responsibility, seem to make it their aim to shift as much work as possible onto the shoulders of the next fellow, are always behind, preferring to idle away their time rather than occupy it to good advantage; and, lastly, we have the careless good-for-nothing, the ne'er-do-well, whose sole ambition is to spend his moments in one continuous round of selfish pleasure, regardless of the feelings of others, and caring naught for whatsoever inconvenience he may cause those to whom he may often be deeply indebted, he goes along serenely, no matter what comes or goes.

As a final portrayal let me cite a type of character which would appear, to my mind at least, as the ideal. For want of a better title let us call him the *"wise, good man"*; learned often in the light of experiences, he utilizes the means at his disposal for the benefit of himself and others, and on no matter what plane he may be stationed, he is always an asset, never a detriment to the circle wherein he is placed. One might write volumes in an effort to describe the predominant factors which may be observed in each individual makeup, but to shift the channel of this topic slightly it may be well, before coming to the main feature of the subject at hand, to linger for a

Digitized by Google

space upon some of the sentiments, many of which, while they may not be so pronounced as to dominate the entire trend of thought, can nevertheless, under certain conditions, exert a remarkable influence upon the life-course of every human being.

It would seem fairly reasonable to assert that as it is difficult to find two individuals who are similar in every respect, even though they follow along the same lines, one would naturally suppose that each is possessed with a different potential or capacity for grasping, understanding, and retaining the essentials and details of that particular branch, and it would further appear that success or failure in any given pursuit is coincident with the interest, the spirit, which is manifested in the work. Some people there are who, aside from the average amount of intelligence, sufficient for adjustment to their environment, possess a remarkable adaptability for certain professions in which they often become so completely absorbed that, as a result, they may adopt certain customs, ways, methods of dress, speech, bearing, etc., and are looked upon by the majority as eccentrics. On the other hand, while almost every one must follow some occupation, either to pass the time or gain a livelihood, there are still a few, perhaps many, who have little or no interest in any line, are fickle in their tastes, show a lack of stability, even in the face of opportunity, and usually constitute the mass of economic and social failures.

Many are the factors which govern the spirit of the hour; but to detain the reader by elaborating further upon the almost countless expressions of good and evil which crop out from day to day in the swarm of humanity would be an imposition indeed, simply reiterating that which he already knows. Let me again, therefore, revert to what I have just previously remarked concerning the spirit which may be shown in the things of everyday life.

As upon the interest displayed in any given science or occupation, which in itself usually leads to better understanding, depends our progression, stagnation, or regression, so it is with those whose mentality has never developed beyond the level of childhood, or who, once having attained the plane of average normality, perhaps even the highest stage of intellectual efficiency, have, through the ravages of disease and mental aberration, descended to a psychic sphere wherein they become entirely out of touch with their surroundings, are a burden to the community or a source of expense and anxiety to

Digitized by Google

their friends, eventually finding their way to an institution for the feeble-minded or insane, where, under the care and supervision of the trained alienist with proper equipment at his disposal, the work of education or reëducation is begun.

At this point let me review in brief the essentials of the material contained in a small volume entitled "The Work of Our Hands," 1915 edition, which deals with the study of occupation for invalids, cripples, aged people, and the mentally deranged. To summarize, therefore, let me take as an initial illustration the work accomplished by cripples in the general hospital and state institution. It has been shown by experience that, like the industrial by-products which today are worth millions annually to the producer, and which not many years ago were allowed to go to waste, there are untold values in damaged human material, the reasonable salvage of which might save a great deal of money and an amount of suffering too great to be reckoned. Acting on this principle, a movement was begun in several large city hospitals to provide some kind of light work for persons suffering from organic heart-disease, who, while benefited by treatment in the ward, would, after leaving, invariably each take up his regular trade, which, often too arduous, was immediately instrumental in bringing about a speedy breakdown. The rheumatic and the paralytic were not ignored, and they, together with postoperative cases and those who suffered from loss or disability of members, accomplished excellent results with employment adapted to their physical and mental limitations under the care of a trained instructor. Artistic designs in flower-pots and other useful articles were made, and by the acquiring of a new art as a future means of livelihood a ray of sunshine cast aside the gloom of infirmity, brightening the way to worth and respect. In some foreign countries and at home skilled trades are taught in regard to individual handicaps, and tailoring, harness-making, book-binding, reed and willow work, silversmithing, die work, cabinet-making, show-card writing, wood-engraving, art glass and mosaic work all tend to restore confidence and awaken ambition. Even in some cases of infantile paralysis work combined with properly regulated and directed physical exercise has proved to be of considerable value in many ways. There is often, however, among those whom misfortune has blighted with crippled bodies a remarkable power of endurance, and this, together with a cheerful

Digitized by Google

heart and philosophic mind, in many cases brings smiles of admiration from more fortunate friends who appreciate the spirit of common sense and optimism even in the face of infirmity and suffering.

One might perhaps entertain the belief that those who have reached the evening of life should enjoy the peace and rest which are requisite for declining years. A more careful study of human character may perhaps by the light of experience, cast an entirely different view upon the matter. Freedom from care may not always bring happiness, and indeed may become so monotonous that health and spirits decline under the strain. Take, for example, the business or professional man who, after many years of labor and patient, well-applied effort, lives to see the realization of his hopes and reap the harvest of wishes fulfilled; his very life in his work and from choice alone he will gladly prefer to die in the harness rather than rust upon the shelf in idleness, enduring the misery of nothing to do. So we find that in the home or institution employment of these people not only raises the vitality to a higher level, but the very sight of industry by those too feeble to work makes life worth living, gives something to look forward to, and tends to create an atmosphere of contentment, where irritability, brooding, and discontent might otherwise shadow the days in decline. With this object in view, in many of the state and city hospitals various crafts have been introduced, such as the making of braided rag rugs, baskets, knitted and crocheted, etc., which not only relieve the monotony of household duties, but while away many hours in happiness which might otherwise be spent in dreary solitude. As variety is the spice of life for most of us, the interest of old age is subject to no exception in this regard, and simple, wholesome employment, not so complicated as to cause bewilderment, is one of the most excellent therapeutic measures for the prolongation of life.

The suggestion has been made that even tuberculous patients, excepting, of course, those who suffer from the acute febrile stages of the disease, might be educated in some useful line under proper hygienic conditions in well-ventilated shops with plenty of air space, or at some outside employment, such as work about the farm, the raising of poultry, truck or flower gardening, which would afford sufficient exercise, the necessary sunlight and oxygen, raising the spirits and improving the health.

Digitized by Google

FIG. 3

FIG. 4

FIG. 3.—Truck farming within the enclosure for the criminal insane at St. Elisabeth's Hospital.
FIG. 4.—Concrete construction work at St. Elisabeth's Hospital.

Digitized by Google

Digitized by Google

Turning now to aberrations of the mind, we find that in state institutions throughout this country and abroad employment of some nature offers the most logical and reasonable solution of the problems of reëducation and readjustment.

From the standpoint of therapeutics as well as economics, the working of men and women of this class has offered returns which not only markedly reduce the general expenditure and to a considerable degree offset the annual cost of maintenance per capita, but the patients have, after a time, varying, of course, in every case, readjusted themselves to conditions requiring mental concentration and steadfastness of purpose similar to those required for a livelihood in the outside world. To carry the general scheme into profitable effect throughout the different hospitals, the installation of suitable machinery for the cutting of cloth, knitting, etc., has made possible the manufacture of stockings, caps, and sweaters, while brushes, brooms, cane-seating, hand weaving, lace-making, printing, and many other useful trades supply most of the personal and general wants. Aside from this, when one considers the laundry, gardening, road grading, farming, and even concrete and mason work, to say nothing of dining-room service and general work on the wards, he may gain a fair idea of the possibilities which await the proper development of industrial pursuits with the insane.

The suggestion has, I believe, been made that each institution might specialize, so to speak, along some particular line, and by means of well-regulated reciprocity an industry might be built up which would be a systematized source of profit and benefit from every angle.

Taking up each form of mental trouble as a distinct identity, I will endeavor to show the usual reaction to employment of the type mentioned and the spirit in which the work is taken by the average individual of that class.

In dealing with *epilepsy* the work should be planned so as to avoid fatigue from overexertion, which might be the means of bringing on a convulsion; they should not be permitted to be near machinery or sharp tools which might possibly inflict serious injury during a seizure. One thing has been stated in reference to these patients, and that is, "There is no class who are more benefited by occupation." On the other hand, the actual teaching of the epileptic

Digitized by Google

is marked by great variation in adaptability and temperament: some are dull and stupid, others lethargic with little or no interest, depressed by the perpetual dread of an attack; while others, cheerful with a normal attitude towards life, are ready to lend a helping hand in any way that will be of assistance to those about them or for the general good. Another thing which may be observed is the remarkable stick-to-it-iveness which they possess, and, although because of poor memory they may not be successful in mental work, they are usually, when once started, deeply absorbed in manual effort, never wishing to leave a job until it is finished.

In the so-called well-to-do patient we usually have an individual who is lacking in definite purpose; and, although the rush of social engagements, travel, etc., may stimulate for a while, there comes a time when these pleasures fail to satisfy, eventually becoming such a tiresome bore that all sorts of fads are taken up in a vain attempt to secure that for which the mind will crave, viz., something accomplished that is worth while. So many of this class finally break down, finding their way to sanatoriums or other such institutions for nervous and mental disease, and there in the simpler tasks of primitive life they secure the rest for mind and body, together with respect for labor which only work with their hands can bestow.

In *chorea,* while rest in bed is essential in the acute stages of the disease, after the twitchings have become less marked light work of some kind may materially assist coördination of movements and, in fact, the general condition, although each case, being a separate problem in itself, often requires tireless patience to accomplish results in a step-by-step sort of fashion.

In many of the "border-line" cases who can not pursue their regular calling, manual work of some kind, especially that which appeals to the fancy, often gives considerable benefit to the party concerned, although the best results are obtained when the individual is allowed to work alone, and is gradually accustomed to working among his fellows in a group only after some difficulty. So also in cases of hysteria, in spite of the apparent paralysis, work of a high order is often turned out with considerable care and pride, although, as a rule, the patient will work much better in a room by himself, taking little or no interest in that which is being done by his fellows; his work should be increased gradually, but should be of

Digitized by Google

a rather high order, perhaps heavy, so as to give sufficient muscular coördination and afford a field for constructive imagination. In neurasthenia, with mental and physical forces at a low ebb and interest in many cases almost unattainable, an entering wedge may be inserted through the introduction of some line of work in which the patient is proficient. In psychasthenia, on the other hand, the work must be restful rather than stimulating, or it fails in its effect. The higher arts may exert a beneficial influence, although the patients are apt to be overenthusiastic, probably due to a desire to avoid thinking of health or whatever idea seems to dominate the mind; while, again, a genuine interest may be displayed; but the desire to complete the task is often too keen, the mind leaping ahead of what the body can accomplish.

Nearly all classes of frank mental disorder can work except those well advanced in general paralysis. In manic-depressive psychosis, while little may be accomplished in the depressed phase, although cheerful industrial surroundings may help, in the excited state a careful distinction should be drawn between work intended to hold the attention and that requiring real creative effort. Nevertheless, as stated in the "volume," the aimless psychomotor activity which prompts the tearing of paper into bits might be directed to the tearing of strips of clothing for weaving or pieces of paper to fill a pillow cover. Simple employment, like the winding of yarn, or work that can be done while the person is standing, is often a better means of substituting useless activity, and, again, where familiar occupation often stimulates excitement, a change of scene, as it were, in other branches, may bring results. Each individual case is a study in itself, and, as in some other forms of mental aberration, the work must be restful, not stimulating.

In *dementia præcox,* a disease which forms one of the principal mental pictures with which the alienist has to deal, we must bear in mind that here is a disorder in which the developmental faculties have come to a standstill, and in consequence a great degree of originality can not be demanded or expected. Again, the shut-in type of personality so characteristic in the malady is living in a world of its own, brooding quite often over events which have transpired in the past, and does not, in many instances, in the beginning at least, take much interest in work of any sort. However, there are many who

Digitized by Google

do react kindly to employment, and with insight into their condition appreciate what is being done for them and coöperate as far as possible. These are the cases who usually get well, and a little later in this paper I will cite some very interesting results which have come under observation at this hospital. Good work done in the proper spirit is an excellent therapeutic measure in dementia præcox, as it often tends to prevent deterioration and cover up, as it were, the marked failing in efficiency. The most difficult forms of the disease from the coöperative standpoint are the catatonic and apathetic states from which the sufferers can hardly be roused to eat, to say nothing of mental or physical effort; and while perhaps the best and, in fact, the only treatment in many at this stage is rest in bed, nevertheless some writers claim that a surprising amount of work can be accomplished, such as coarse knitting, raffia, etc., which may tend to rouse the patient from the stupor.

After this brief citation of the valuable material contained in "The Work of Our Hands," I take pleasure in laying before the mind of the reader a short synopsis of the effort made and the progress gained at Saint Elizabeth's Hospital at Washington, D. C.

In the first place, let me give you a few figures showing the census taken April 4, 1917, and the number of patients throughout the various services who were employed in the different departments on that date.

SAINT ELIZABETH'S HOSPITAL, APRIL 4, 1917

Census

Males:		Females:	
White	1946	White	528
Colored	425	Colored	313
Total	2371	Total	841
		Grand total	3212

Receiving Service—Male:

Capacity	686	Tailor shop	7
Number of patients	660	Greenhouse	2
Paroled	90	Ward work	135
Working:		Sundry work	26
Laundry	23		
Dining-rooms	10	Total	205
Store-room	2		

Digitized by Google

Detached Group Service—Male:

Capacity	730	Barn	5
Number of patients	721	Greenhouse	2
Paroled	199	Upholsterer	10
Working:		Baker	1
Laundry	28	Carpenter shop	1
Kitchen	21	Sundry work (including 4 in brush shop, 4 in shoe shop, 2 in mattress shop)	31
Dining-rooms	31	Ward work	50
Farm and gardens	19		
Store-room	1	Total	213
Tailor shop	4		
Grounds	9		

Howard Hall Service (including prison department for criminal insane):

Capacity	498	Power-house	21
Number of patients	470	Work-room (rugs, cane chairs, etc.)	10
Paroled	10	Barn	1
Working:		Bake shop	2
Laundry	2	Sundry work	11
Kitchen	8	Ward work	36
Dining-rooms	37		
Store-room	1	Total	165
Tailor shop	1		
Grounds	35		

Richardson Group Service (many sick and bedridden cases):

Capacity	519	Dining-rooms	26
Number of patients	491	Tailor shop	7
Paroled	76	Ward work	48
Working:			
Kitchens	5	Total	86

Female Department (Receiving Service inclusive):

Capacity	837	Total male patients	2371
Number of patients	823	Number employed	669
Paroled	86	Total female patients	841
Working:		Number employed	389
Laundry	23	Total employed	1058
Kitchens	5		
Dining-rooms	63		
Sewing-room	45		
Sundry work	68		
Ward work	185		
Total	389		

It must be borne in mind, however, that, aside from the above figures there are many patients—in fact, the majority of the better class—who clean and care for their own rooms, and nearly every person seems to take pride in keeping everything in good order, ready

Digitized by Google

for the doctor, especially on Saturday morning, when he makes his weekly tour of inspection. The number of working patients is steadily increasing in the Government Hospital, and we hope, as springtime approaches, to place a much larger force of men at work on the lawns, grounds, farm, roads, etc., as most of the patients are glad of the opportunity to pass the time by occupation in the open air, while others who, because of mental reduction, seem indifferent when asked to help, nevertheless, after a time, actually render good service at manual labor. At the conference of the medical staff, which is held every day at this institution and presided over by the superintendent, every case which is brought up for parole of the grounds is questioned as to whether or not he or she is willing to be assigned some work; as a rule, the reply is in the affirmative, and, aside from this, many of the men who have been permitted to visit the city use their best efforts to secure profitable employment.

As a means of assisting these worthy people, after their mental stability and fitness have been passed upon by the examining board at conference, a letter is written to the firm which may be kind enough to hire their services, and if finance happens to be at a low ebb in any particularly worthy case, the parties concerned may, through the benevolence of the superintendent, board at the hospital until, from a money standpoint, they are able to shift for themselves. One of the large steel corporations located in the vicinity has been, and is, very considerate in this respect, and many a patient among the long list of those who have made "good" is indebted to the management of that company for his first new start in the right direction. I venture to say, also, that the majority who leave us have gained insight into the nature of their trouble, and, taking advantage of what analysis has revealed to them in reference to their having been detained in an institution for the insane, leave our care with only words of praise for what they have received.

I would not, however, wish to deceive the reader by creating the impression that all our efforts are crowned with success, as in any walk of life one succeeds where many fail; but, however, as the principal object here is not primarily to get the patients to work, for we can not and do not force employment on any one, we aim to teach them to think logically, concentrate definitely, and act in such a way that in an effort to adjust to worldly surroundings they are an asset, not a detriment, to society at large. Perhaps if some of

Digitized by Google

our feeble-minded cases, moral delinquents, and juvenile criminals starting early in their career were snatched from the permeating atmosphere of squalor and vice, and, while still young, placed in such surroundings where their interest might be cultivated along decent and legitimate lines, the number of patients in institutions and cases on the docket might be decreased.

Another fact which I would like to bring out is that, while the functions of occupation are therapeutic and economic, there is yet another, viz., that of recreation, which is of prime value to those who are mentally afflicted. This is accomplished in many different ways aside from the usual daily routine; for example, we have here at the hospital a circulating library for patients, containing upward of seven thousand volumes, aside from magazines and periodicals. These are available for any one who cares to utilize the privilege. The dances and moving-picture shows held during the winter months are a diversion to be enjoyed, while during the summer months the band plays twice a week on the lawns. In October, 1916, the women patients' fancy work exhibit was held at one of the open pavilion wards, under the auspices of Dr. Mary O'Malley. It proved a financial success and a beneficial measure in hospital administration, as it afforded the patients an opportunity for comparison, exchange of ideas, and social intercourse. It is, as stated by the doctor, the desire of the hospital to encourage such gatherings, as it leads to concentration of attention for a useful purpose.

In dealing with the mentally sick patients who come under our care we must always remember that each observed is a human being with feelings, longings, likes and dislikes which are distinctly his or her own, and which require understanding on the part of the physician before he can fully appreciate the nature of the difficulties under which the patient is laboring. One must study the disposition of his patient, his spirit, his temperament, his ambitions, his hopes, together with the conflicts which have arisen in the life-history, in order that by means of psycho-analytic study he may be able to unravel the psychic tangle, awaken the soul from brooding dreams of unreality, and open to the conscience the door of truth. The spirit of selfishness, anger, bitterness, false pride, sloth, and the thousand-and-one other evil thoughts, together with resentment, must be cast to the winds and in their place should be substituted good habits which, constructed upon a solid foundation of logical understanding, lead, through the spirit of effort, to new and brighter things.

Digitized by Google

Public Health

SEX HYGIENE AND ITS TEACHING

BY I. D. STEINHARDT, M.D.

In an address of about thirty minutes, I am going to endeavor to talk on a subject that requires a volume, so if I fail to say all that can and should be said upon my subject, just remember this opening statement. Perhaps I should have called my paper a tabloid talk upon sex education and the necessity for it, and thereby protected myself against criticism.

The question of sex hygiene and its teaching must be divided into two parts: first, the necessity for such teaching, and, second, upon whom shall such teaching devolve—physician or layman? Needless to say that I am a most earnest advocate of such teaching of sex hygiene as may be called honest and sane for both sexes, otherwise I could not have consistently become the author of two sex hygiene books, one for each sex, for personal and public instruction upon this very subject, and I am sincere in saying that I gave the matter very deep and earnest thought and devoted much time to the pro and con of the matter before I decided in the affirmative. I finally decided in the affirmative after a very thorough investigation into matters as they are and seem to be drifting. In making these investigations I think I, like others who have done the same thing, wondered if innocent children had become extinct and if modesty and morality were on the same downward path. I hope, before I am through, even with this glimpse into this great subject, to show you why you should all be advocates of sex hygiene teaching, both because you are physicians with the public welfare at heart and charged with the guardianship of the health of the community, and perhaps more so because you are parents or brothers with the best interests of your children or sisters as your highest and most earnest desire. If I make you appear selfish in my last statement, I do not believe it requires an apology, for it is but nature to guard our beloved ones.

Digitized by Google

It must be stated right here in the very beginning that I want it most distinctly understood by my audience that in advocating the teaching of this subject I believe the instruction should be honest and frank, but absolutely non-sensational, and deal only with facts, and not personal theories fit only for discussion before scientific bodies. I advocate the "safety first" kind in which the mind receives only what it can assimilate properly and easily. A spade must be called a spade, but in such a plain, matter-of-fact way that it must appear as if nothing unusual has been or is being spoken of to your hearers. Your instruction must not be made to sound secretive, mysterious, or something that must be spoken of only in whispers or behind closed doors. This would be and is a great mistake. Such teaching must be open. In other words, complete sanity should exist, and perfectly unembarrassed accord must exist between teacher and pupils, be they male or female, and whether the instruction be coming from one of like sex or the opposite one. To make the teaching a real success and really understandable, both teacher and class must feel at ease with each other, and the subject must be thoroughly and properly dealt with in a clean, even way; far better no teaching at all than a dangerous curiosity aroused and allowed to go unsatisfied at the proper fount of knowledge and understanding. If the teacher can not or does not satisfy his hearers, or is too modest, retiring, or what-not to fully and understandingly answer any and all questions which may be asked, that instructor is not suited to teach the subject, and his hearers will find street companions, of more or less viciousness, who will answer and in a way which may be best suited to their purposes. Of course, I might say, and with truth, that this latter way is the present idea in most families in all walks of life of how the growing generation should receive its knowledge of things sexual, and the bad result of this careless way of "taking chances" speaks for itself.

Fond parents deceive themselves into believing that their children, at least, and particularly their girls, are in absolute ignorance of things sexual until their daughter's disgrace or the advent of the son into the home with some loathsome disease awakens them to the truth. You can very readily get them to believe that sex hygiene instruction would be a most excellent thing for their neighbor's children, but, as for their own, they are above reproach until the explosion comes which ruins the lives of all concerned.

Digitized by Google

In making these foregoing statements I speak from an experience of several years as a public lecturer on this subject, with classes or audiences made up of, at times, entirely of girls and young women, and likewise, at other times, the hearers were boys and young men. These were not by any means small audiences, either. At one place I had, during a girls' series, an audience of about seven hundred and fifty. I can not tell you how many times members of my audiences, both male and female, have asked me why their parents have not spoken to them of these matters instead of allowing them to get only the improper street knowledge as their basis of thought on these matters, or of having them wait until by chance some educational or social centre gives a sex hygiene course of lectures of which they can take advantage. It may have occasioned some surprise among you when you heard I was to present to you a paper upon this subject, as to most of my audience perhaps I am known better for my work in the realms of orthopædic surgery and pædiatrics rather than as a sexologist, but, after all, if you will but think about it, this subject is very closely related to all branches of medicine, for where is the medical man, be he internist, surgeon, or specialist in whatever branch you will, who does not see the ravages of venereal disease in his practice, and wish that something could be done to make it otherwise? Sitting still and wishing get us nowhere at all, in the first place, and, besides, as expressed by me in a paper presented before The Medical Association of the Greater City of New York, and entitled "The Ideal Physician as a Citizen Builder," I stated it to be not only the right but the positive duty of every medical man, no matter what the particular branch of medicine he followed, to be a good citizen. If, therefore, any excuse be needed for my presentation of this paper, I offer you this one for being so intensely interested in this very important subject, which not only concerns us in our professional field of labor but in our own home life as well, and in the home of every one of our patients.

We mourn our helplessness in many of the diseases which we class as incurable, but these patients have their suffering relieved by death; but every girl who goes wrong is not so fortunate, nor are her parents and her family, for they must live on enduring the pain, suffering, and disgrace that ignorance or brutality of the male animal has brought upon them. As a matter of fact, every man and woman, every husband and wife, every father and mother, every brother and sister, and every

Digitized by Google

professional and non-professional person should be deeply interested in this very pertinent matter. It is a conspiracy which must be arrested instantly and forever if we are to stem the mighty wave of immorality which threatens to overwhelm us with its grim, debasing, and destroying results of civilization, such as ours at the present time, and which, if unchecked, will tend to make virgin brides as rare as common sense—something we all know is a most rare commodity these days. Even from the blood-stained battlefields of unhappy and distraught Europe come tales of the most shocking, cold-blooded, and almost unbelievable animal lust and immorality in which not only women but half-grown and even little girls are the victims of male animals. I can not with justice call them men, who have evidently lost all sense of reverence for their mothers, wives, sisters, and daughters, and even their fear of going before a future judgment-seat in the presence of the Almighty, for even "in the valley of the shadow of death" are these positively atrocious crimes perpetrated. If you doubt any part of my statement, read the latest book of the American Jewish Committee, entitled "The Jews in the Eastern War Zone."

There would be no reason for instruction in sex hygiene at a very early age if all homes were ideal, and if we could have our children by our sides literally and figuratively at all times. When such a millennium comes to pass I shall be one of the very first to decry such teaching, but even then I shall be in favor of proper sex education, and again note I say "proper sex education" to distinguish what I have in mind from alias sensational and really immoral substitutes for the older boys and girls, for certain things come into their lives at puberty which excite curiosity and wonderment, and a simple correct and entirely clean explanation will always be more satisfactory and instructive to both parents and children than vicious, untrue, and "dirty" street definitions of natural life events. These changes are particularly more noticeable in the female on account of the establishment of the menstrual period, but in both sexes the event of the pubic hair is very likely to cause comment in the beginning.

The rite of creation or the marriage relation, or whatever name you wish to give this act between the sexes, should be instilled into the minds of our growing generation as a something for which they must have the highest possible reverence and veneration, and the failure to observe it as such the greatest sin that can be committed against either

Digitized by Google

God or mankind. When this glorious vision can be made into a reality, what a wonderful increase of human health and happiness! What a great decrease in broken-hearted parents, ruined homes, girls in nameless graves, human harpies, women-supported brutes, cripples, insane persons, blind and syphilitic-racked men, women, and children! What a decreased need for genito-urinary and gynecological specialists and, in fact, for all physicians and surgeons! We might even perhaps be able to arrive at that very sensible Chinese medical plan of getting paid for keeping our clientele well instead of attempting to cure them after they become ill.

On what do I base my assumption that sex hygiene teaching is a necessity? On the same things that we all meet in our everyday practice, whether it be in free or private work. We see men who, with uncured venereal disease, have married, and are in complete ignorance of the fact that the unfortunate women who have elected to share the future with them are going to be given these loathsome conditions, to the detriment of their health and the well-being of the future children. These selfsame men, who in many instances have sinned only through an erroneous idea that their sexual vitality would become lost if not exercised after they had arrived at a certain age, are ignorant of the fact that the impairment of their health is such that they should not, either from an economic or social standpoint, attempt matrimony. I regret very much to say that in many instances the story of "lost vitality" can be traced back to conversations at their physician's office. I did not believe these statements of "physician's advice" when I first heard them, but personal investigations and conversations with several medical men have convinced me that at least some of these men have told the truth. We also see women in our practice in whom married life has only had for its reward ill-health and invalidism, which, of course, is only another way of saying unhappiness. The assumption is that if these women had ordinary human intelligence and were educated to the fact that uncured venereal disease in the men they were going to marry would mean ruination in health to them, it is fair to presume they would not rush into matrimony with such men for husbands, nor is it very likely, with the truth brought home to them, that the old falsehood that a young man need indulge his sexual organs before marriage to protect his sexual power is nothing but a falsehood; it is not very likely that they would grow up willing victims of,

Digitized by Google

and passive subscribers to, our so-called double standard of morality, by which not only are they the sufferers, but, what is even more important to every true woman, the life, health, or sight of her offspring will be endangered. If the faddists of many of the "isms," such as birth control, feminism, etc., would work along this line, their present misspent energies might be productive of real good to humanity.

Again, to come to the young growing population of early adult life, does it seem possible that the young man would risk his whole future by holding illicit sexual relations if he knew truthfully the risks he was running, and the fact that, as he tried to lead other girls into temptation and moral ruination, other young men with like lack of real appreciation of the act involved and also the lasting disgrace they were putting upon the victim of their lust, were also attempting to approach his own sister in the same way? In other words, if from young boyhood up reverence and respect for the opposite sex were constantly kept before him, and he were taught to look upon himself as their protector, do you think that he would rush into immorality so easily? If with the female child, do you think that if she resented undue familiarity her ruination would be so easily accomplished as it seems to be to-day?

We are all aware that immorality is not only the act of the paid prostitute of the street, but, most unfortunately, we have the clandestine prostitute of private life who would resent the imputation that she were no different from her more unfortunate sisters of the street into whose ranks she is destined to go before her life-course is run, because her operations in the field of immorality are confined to a non-financial basis with some alias friend or lover.

I recall a case of only a few short weeks ago when I was asked by a young girl to please do something for her condition of "skipped" menstrual period, and who, on my refusal to "help her out," said I must think that she was just an ordinary prostitute, whereas she wanted me to understand that her sexual experiences had all been with the same man, who had promised to marry her some day, and from whom she had received no reward whatsoever for offering up her body for his satisfaction sexually. I might also add that she most bitterly denounced her mother for not giving her some sex hygiene instruction and warning her against the dangers to be encountered in

Digitized by Google

the business world when she was sent out from the protection of a home in which all such conversation was tabooed.

If sex hygiene teaching is a necessity, the first question which arises to your mind is, At what age ought it to be begun? In answering this, I will elaborate somewhat to make my answer explicit. Sex hygiene teaching, like other good habits, to be instilled into the child must be begun at birth almost, and, because of this early beginning, must, of a necessity, be practical rather than didactic, or perhaps mostly practical and slightly didactic, for, to the young baby, language means little and actions and impressions much. Every physician who has had much to do with babies will agree with me that masturbation, even though without knowledge of its significance, is a very common practice with them. Observe the young baby and you will see that almost as soon as the movements may be described as coördinate, that when stripped for the bath or otherwise, and when the diaper is removed, making the sex organs accessible, the baby, whether male or female, will almost immediately put its fingers in and about these parts. Of course, if this unconscious, but nevertheless definite, pernicious habit of infantile masturbation is permitted to go on uncorrected, it will soon be most firmly established and will become, later on in life, a fixed act of intended actual masturbation.

It is hardly necessary, in speaking to an audience of medical men, or, in fact, even to a lay audience of adults, to say how undesirable a habit this is, either early or late in life, nor is it necessary to dwell upon its harmful possibilities.

If you were to ask me how the baby comes to do this thing, the only answer I could give would be to state the question of hereditary instincts entering into it, and that to go further would bring us into the realms of psychology, for which we have not the time to-night.

Very often a child is given the habit of infantile masturbation by the action of the mother who, in an excess of affection, kisses the child over the body, and I have personally observed, as have any of you who have endeavored to make the same observation, children laugh and crow in pleasurable anticipation when the mother begins to remove the clothes. One may also observe the child grow rosy red and stiffen out as the height of pleasure is reached from this erroneous way of expressing love for the child. Many of you will immediately think that I am putting a wrong construction upon an everyday natural ex-

Digitized by Google

pression of mother-love. I am not, however, but merely stating the actual result upon the child of this particular way of showing affection. No criticism is intended of mother-love, of course, and as you explain the harmfulness of this to the mothers they will be the first to do away with it.

Again, other forms of masturbation are those in which a child will stand against a bedpost or other place and rub its body up and down, giving vent the while to little gurgles of delight and satisfaction. Again, the careful observer, noting the result from a study of the child's countenance, will see the face flush and the look of pleasure come and the little body stiffen at the "critical moment."

For more detailed statements on infantile masturbation, I refer you to any standard work on pædiatrics and also to a most excellent recent article by Doctor Freeman, of New York City. I repeat again that sex education at this time of life must be intensely practical. Just as soon as baby's hands wander into these forbidden regions they should be immediately removed with the admonition of "No, No!" several times repeated. It may even be necessary to very gently slap the little hands to make your admonition more emphatic. Watchfulness and perseverance win the day, and the child's first lesson in sex hygiene is accomplished with excellent results.

The next point of attack against the learning of bad sexual habits is when the baby has become a little toddler and mingles a little with older children. In this particular case the children I have in mind need not necessarily be very much older. I recall a case seen a little while ago at the Cornell University Medical School Clinic which will illustrate my point. A child was brought into the surgical department with a very sore and much swollen penis. His age was somewhere between three and four years. After a most careful and painstaking examination I could find no evidence of infection or other reasons for this condition, and was very much puzzled until I brought into play my knowledge of the possibilities of children in regard to the handling of each other in the sexual parts. Careful questioning elicited the information that the little boy across the hall had been "playing" with this little fellow's penis a greater part of the morning, while the two children had been permitted to romp together in one of the hallways of the house.

I have also in mind a case of acute gonorrhœa in a little boy of

Digitized by Google

two years, as proved by a smear from the penis, in which the etiology led to an older sister of four years of age who had been discovered by the mother tampering with her little brother, and a smear from whose vagina proved positive for the gonococcus.

Again, it is no strange sight in either your private or clinic practice to see children who, when stripped for examination, keep constantly handling themselves in these parts while awaiting their turn. Times innumerable I have called the attention of the parents to this, only to be told that they also had observed it, but, not understanding its significance or harmfulness, had made no attempt to stop it.

The common prevalence of gonorrhœal vaginitis in young children in all walks of life can also be partially traced to this altogether too common practice of children handling each other in these parts. Therefore, lesson No. 2 in sex hygiene must be given at this early stage of life also, and must consist of lesson No. 1 repeated, plus instilling into the minds of all children, whether male or female, that these parts must be kept covered from all, and also that under no circumstances must they be handled by themselves or others.

It seems to me that the practice of permitting young children of opposite sexes to undress together, and therefore, as like as not, to be exposed to each other, is to be condemned most emphatically, as is also the practice in many families of having young children of the opposite sexes occupy the same bed. These young children are very liable to get into bad habits because of talk they have heard. These two statements are distinctly opposed to some recent books and articles published, but sound to me like solid common sense. "Safety first" is very good advice to follow in all cases, I believe, and one must guard against extreme radicalism as well as ultra-conservatism. I prefer to proceed slowly and feel sure of my ground rather than rush into extreme "isms," with possible bad results. The old quotation, "Make haste slowly," I think, still holds good. It is this extreme radicalism that makes the work of those who would educate properly so hard to advance, for the general public, which must receive and endorse this work, has no way of judging between what is offered it, so far as fact and theory go, and ofttimes the radical "for revenue only" is more gifted with eloquence than the honest teacher.

As children grow older and we approach the age for school, we approach a time of great danger for the child, for here even the most

Digitized by Google

carefully brought-up and watched-over child is going to get into a different environment. The new little pupil now enters the great American "melting-pot" through which all nationalities are amalgamated and turned out as good Americans. It is no criticism of the teachers to say that also the schoolhouse—or maybe I ought to say that school life—is a great factor in the dissemination of bad habits. The teachers can not supervise the children on their way to and from school, in the recess yard, or in the toilet-rooms, and it is at these times and places that children who have become learned in either bad language or habits disseminate this vicious knowledge to what is usually unfortunately an admiring and most appreciative audience. You see, the element of mystery and of something forbidden is in this affair, and mysterious or hidden things or words are usually prone to arouse curiosity. All these statements about the schoolhouse and school life refer to both sexes. I have verified them by asking various children as to the place where these vicious words and habits were first brought to their notice, and I found this school association greatly to blame. In fact, I might truthfully state that several public-school teachers in charge of classes of both girls and boys of young age have asked me for advice by which they could stop this harmful habit of masturbation from being actually carried out in the class-rooms before their very faces. Of course, while forcing the children to keep their hands in sight at all times very easily did away with the masturbation accomplished by the hands, hip and thigh masturbation and that brought about by other means were not so easily to be guarded against. I took occasion at this time, however, to warn these teachers against ever denying a child the right to leave the room for the purpose of emptying the bladder, for in endeavoring to restrain an involuntary emptying of the bladder this vicious inclination came about and was fostered. Therefore, lesson No. 3 in sex hygiene is really the previous lessons emphasized; that is, again warning the children that under no circumstances are they to allow themselves to be handled by others, no matter what the pretence, or to remain present when the sexual organs of others are being exposed; to shun companions whose language is unfit and, so far as is possible, to keep out of strange toilet-rooms. Girls, especially, should be warned to avoid sitting upon toilet seats outside of the home without using a paper cover over the usual wooden seat. The reason why, you all know.

Digitized by Google

Children should also be warned against having any secrets from their parents, especially the mother, and should also be taught to tell their parents immediately of any unusual conversation or acts on the part of their companions, whether in school or elsewhere. I do not believe that in homes children should be allowed to play entirely unsupervised, for even in the homes where little girls and boys have been left alone to play a child with unknown but vicious tendencies has wrought great harm.

If time permitted, I would recall to you a case in the Bronx where a vicious little miss of eleven years ran a regular house of ill-fame in the absence of her mother, and was found out only by mere accident. I know that every parent believes that all these things could happen to other children, but not to theirs. I also know that these statements may seem exaggerated to you, but any one who has made a special study of children, their sayings, their doings, and their habits, will verify what I have said.

There is an old saying, "As the twig is bent, so will the tree grow," and I believe that the boy or girl who arrives at puberty without any immoral ideas or tendencies and who has escaped these harmful habits is going to be better fitted to continue in the path of right living than the one whose childhood has not been so clean. Force of habit is something to be reckoned with.

About the age of twelve or thereabouts the sex instruction for the opposite sexes must begin to differ somewhat. Of course, the teaching of reverence for the sexual parts and their duties is still a teaching in common, but with the girl at puberty the expected beginning of the menstrual period must be anticipated by a talk regarding this function. The most plausible reason for this function must be explained to anticipate a question of this kind. The necessary care that a girl must take of herself at this time should be talked about. The significance of the pubic hair and, I think in most cases, the question of the marriage relation could be more or less touched upon, for, according to a good many reports from both courts and rescue societies, the girl from thirteen years on up to seventeen years seems to be the easiest victim of immorality. Several recent high-school scandals, in which the majority of the victims were girls between these ages, I take occasion to mention here to verify this almost unbelievable statement.

Judge Barton, sitting in the night court of New York City, only

Digitized by Google

recently made the statement that, so far as he could judge from his judicial experience, the women of the street were principally such because girls are not taught what will happen to them if they take the first step, and he most strongly advised the lady to whom he made this statement—she being the editor of the magazine *American Motherhood*—to make mothers understand this fact.

Judge Herbert, a judge of the New York City Court of Special Sessions, has likewise made a statement which I think will bear repeating. He says: "If parents would keep a closer eye on their girls and the companions of their girls during the danger period, they would save many of them. They should watch their girls' associates particularly. The danger does not lie half so much with the boys the girls go with as with the other girls."

To quote again a statement. The editor of *American Motherhood* says as follows: "Every woman who stands before the judge's bench and is arraigned as a common prostitute, a street walker, and a solicitor was once a clean-souled little girl even as is yours to-day. In her case, somebody failed—her parents, her home, society—nobody knows where the failure lay, but failure there was. There is a danger that any one of us may fail. The little girls that prattle so innocently to-day will, in a few short years, be the women who will be—where?" If some one has failed in his or her duty, let it not be said that the medical profession failed to see the danger of ignorance and silence in this regard, or, if they did see it, failed to sound a proper warning to the parents and did not urge that this danger be reduced to a minimum by proper education in sex hygiene. Time limits a detailed statement of what should be told to the growing girl at these ages. My ideas, however, of what should be told to the growing girl and young woman I have set forth in my sex hygiene book, "Ten Sex Talks to Girls."

To sum it up in a brief way simply means to warn her of the wrong and danger of sex familiarity on the part of her own sex and the moral ruination and disgrace which will be her share if she partakes of sexual familiarities with the male sex. The safest way is not only to go into detail regarding many things, but make it sink deep into the gray matter that it is *not* the male acquaintance or friend that attempts little familiarities or is constantly praising and flattering her who is the real friend, but rather he is the person to beware of; whereas, perhaps the man who is very critical and who does not think

Digitized by Google

her perfection is really her friend. Teach her to make her keynote in her daily life that she will not permit the slightest familiarity of any kind, for if the man or boy is stopped right at the beginning, he will not attempt to go further, except at the peril of the loss of her friendship.

You might think that as physicians you are not called upon to be moral censors of your patients or even to give much advice. I claim that you are, for not only are you the only one outside of the parents who has a chance to help along in making your patients safe and sound morally, but ofttimes the parents expect this interest of you, and to those physicians who are "family physicians" only without being the family friend I say you fall short of the best traditions of our profession and of the trust and confidence reposed in you by your families. Ofttimes your chance for saving a girl from an immoral life is a great one, for often wrongly applied parental authority galls and is therefore not listened to, whereas yours, on account of the very knowledge you are credited with and on account of the respect in which you are held, will be heeded. Physicians have a grave responsibility in this respect if they will but realize it. I can say from my own experience that I know this to be true, and personally have a little probation school which consists not only of some who have already offended, but some who would have gone to the bad had not a helping hand gone forth to save them from themselves. Do not deceive yourselves for a moment that all or most of these girls are of the poorer or uneducated class, for they are not, but consist of a great variety from every walk of life, including college students, high-school girls, girls from well-to-do homes, business girls, and so on down the social and business scale. It might interest you to know that some of them I have never seen, but know only through the correspondence I have had with them. These, of course, are out-of-towners who got to know of me through my book, put themselves into communication with me, and received what I hope was good advice in each case.

When the boy arrives at puberty, again general considerations must answer for all, with special consideration for some. I have had several men of family tell me their sexual immorality started at the ages of twelve to fourteen years. It is only fair to state that in most of these cases the immorality was more thrust upon them than sought. I regret to have to record the fact that in some of these cases it was

Digitized by Google

married women who started these boys on the downward path of immorality and made them beasts of prey upon the daughters of man. It seems to me that the keynote of all teaching to the growing boy and young man should be to instill into him the greatest possible respect for all of the sex of his mother and sisters, and to make him realize that any harm he may do to any girl or woman is an offence against his mother and sisters, and that if he thinks he is privileged to offend against the beloved of other boys and men, he must be willing to have, and expect to have, his beloved ones offended against in the same way. This is really the keynote of my book for boys and young men, and, no matter what else I am talking about to them, I never let this keynote be lost sight of.

I also think the dangers of venereal diseases should be brought home to them without sparing one's powers of description, and the absolute possible end results not only to himself but to a future wife and children should be vividly dwelt upon. In answer to this some of you may say: "But medical students know all about these things and are immoral, anyhow." If this is true, I think it can be easily explained. I think you will find, upon investigation, that it is usually those in the earlier years of study, and also those who are not yet used to freedom from home control and who are sent out from this home circle improperly grounded as to right and wrong. It is unfortunately true that only too often a father complains and worries about the fact that his son is not showing any disposition to "sow his wild oats" by despoiling the sex of his mother and sisters, instead of thanking his lucky stars that the boy is showing more sense and character than did his father before him. Is it not a finger of shame pointing at the medical profession that the records show seventy to eighty per cent. of gynæcological operations due to venereal disease? Is a medical student who is immoral during his apprenticeship, as one might call his college and hospital internship years, fit to enter the profession? Does he measure up to the Regents' requirements of good moral character, and would we as medical men and as fathers have such as he attempt to treat our daughters and perhaps have them insulted and assaulted by him in the course of the consultation? Unfortunately there are black sheep in every walk of life, and this accounts for the fact that some girls in this city and elsewhere owe their ruination to doctors who used their offices as houses of ill-fame. We must educate

Digitized by Google

the young man and boy by personal example as well as by words, for "Words are the leaves, deeds the fruit."

I am one of those who firmly believe that sexual indulgence at any age or stage of life is absolutely unnecessary, and I believe that this fact should be instilled into every male and female. All the sensational stories of unused sexual organs becoming weakened or unfitted for proper duties later on in life should be branded as untrue and the reasons why explained. The fakers and sensationalists should not be allowed to prey upon the minds and pockets of these growing boys and young men with their terrifying accounts of what will happen if so-and-so is indulged in, and another so-and-so not indulged in, and how "vitality," a high-sounding, mysterious, and convenient word for their purposes, will be lost with night emissions and masturbation. We will agree, I think, that either too frequent night emissions or excessive masturbation is harmful, but we know from fact that gonorrhœa or syphilis is still more harmful, and that sexual indulgence does not cure either of the first-mentioned conditions.

I have had under my care several men and women, parents of fine families, at various times who wanted to be cured of the habit of masturbation. What better proof of the falsity, therefore, of the foregoing statements? Remember, these were not cases of marital unhappiness or unfitness, but just the facts in real cases.

As to night emissions, if you can find the physical and mental cause for them you can usually cure speedily and without much medicine. In severe cases of long standing a harder problem confronts you, but you can cure them, and you must let your patient know this at the beginning of your treatment. In a proper sex hygiene course they must be given a good deal of attention, but do not make your emphasis such as to make them appear at all fearfully serious. Treating of them in your instruction with just the attention they deserve, you will find that many cases will cure up at once and many of the so-called sexual neurasthenics will get better.

Another reason why they must receive attention in a sex hygiene course is because they are a great topic of conversation among boys and young men, and the advice of a doctor who does not know, or the street companion who thinks he knows, to seek sexual indulgence as a cure starts many a boy to destruction, and destruction is the right word

Digitized by Google

to use, for every medical man knows the possibilities of the end-results in venereal diseases.

To my idea, boys and girls should be the most friendly companions from childhood on, for this does away with the mystery surrounding a girl in the mind of the boy, and makes her a steady companion, deserving of his respect and protection as they grow older. I think the average boy and young man who has had the right kind of training as a boy and who has also had the right kind of girl companions right along is less apt to be thoughtless or worse in later years in what harm and pain he causes any girl. Of course, he must have had the right kind of early girl companions, for I have already told you of the early sexual familiarities of childhood, and again, to prove my point, I will quote verbatim from a letter received only a few weeks ago requesting me to give a course in sex hygiene lectures in a certain neighborhood. The writer is a seventeen-year-old girl who writes to thank me for the good my book has done for her, and ends her letter as follows: "I often see the little girls and boys playing together, and sometimes they even go so far as touching each other with their sexual parts," etc. Often those of us who take the stand that I do—that sex hygiene instruction is a necessity—are told we are alarmists, and that we imagine the necessity exists. This letter is very clear as an answer to such a charge, and I have others.

Can we harm these children with sex hygiene instruction, or will we benefit them? If the conditions were not so serious, we could laugh at these assertions. I can assure you that when I first became interested in this work the knowledge that the average girl and boy had positively surprised me, but, unfortunately for them, it was in many cases wrongly acquired or false knowledge.

Letters like the one I quoted from a few minutes ago are not at all rare in my mail, and if the parent or medical man would inquire of the growing generation they would join the ranks of we so-called alarmists. The minute men of "'76" were also so-called alarmists, I would remind you.

Once again I will digress a little to illustrate a point by a personal experience. A few years ago I was called out of the city, the day before a holiday season began, to see a patient in a town where was situated a well-known military educational academy, in whose public advertisements was stated the following: "Our pupils' morals care-

Digitized by Google

fully supervised." I do not know what the supervision consisted of, but the language and actions of some of the boys of this academy whom I happened to meet on my homeward-bound train would have made a Broadway rounder or Bowery *habitué* blush and look to their laurels. What they did not know of the filthy, seamy side of sex-life had not been invented yet. The women in the car left it very speedily, and finally the men forced the conductor to quiet them down. I investigated and found that this school had no sex hygiene instruction course for its pupils, big or little, but the fast women of the town did, and I will leave it to your imagination to guess what it consisted of. Even the pennies of these schoolboys were not repulsive to them. I would like to keep on with this part of my subject indefinitely, but I am afraid that too much at a time would become tiresome, and perhaps if I give you too much food for thought along these lines I might bring about a "mental indigestion" that would spoil the effect of what I hope I have impressed upon you—the absolute need of sex hygiene teaching—and, besides, I want to devote about two minutes more to the second part of my subject—who shall teach it?—before turning over my fully completed paper to those who have been especially invited to discuss it, and to my audience in general.

Perhaps because I am a physician I say a physician should teach this subject, but he must combine, however, the ability of a teacher with the knowledge of the subject. He must know his subject thoroughly and, what is just as important, must be able to impart it in an understandable manner to those he would instruct. With the physician as a teacher of sex hygiene, I can see no particular objections to the male physician acting as instructor to both sexes, for the child from infancy up is used to the family doctor and doctors in general talking to them about their bodies and themselves. That there is a decided difference between an "at home" feeling and anything bordering upon familiarity of speech or action must always be borne in mind, whether the teacher be physician or layman. Classes must be taught both according to age and requirement, and no half-way compromises should prevail. Those of you who are familiar with my books on sex hygiene know that in both of them the course of instruction starts off with a talk upon their respective anatomy in the sexual parts. I remind you, however, that my books were intended for the growing child and young adult of about fourteen years upward, and that I

Digitized by Google

have tried to be strictly practical. It might be best in school courses to have a simple preparatory course in biology, but I do not think that an effort should be made, as is done in some schools, to let the pupils believe that nothing that is being shown has to do with human beings. This attitude, it would seem, would defeat the very object of the course, and, besides, why play at teaching a most serious subject and make more pointed still an already aroused curiosity? There is nothing to be ashamed of in the act of human creation, and the aim of your teaching is to do away with mystery and make it an object of reverence and respect.

In closing and turning over to you my paper for full and free discussion, I trust I have interested you in my plea for proper sex hygiene teaching, both from the standpoint of your profession of parenthood and that of medicine. I have tried to crowd into a limited time a good deal, and in doing so I hope I have not been tiresome. I know I have not entirely covered my subject, but who could in about half an hour—or even thirty hours? I thank you for your courtesy in permitting me to bring this important subject before your society, and wish to place myself at your disposal now or in the future to answer any questions you may wish to ask me.

Digitized by Google

Surgery

THE SECONDARY SUTURE OF INFECTED WOUNDS AFTER THEIR CHEMICAL STERILIZATION WITH DICHLORAMINE-T

BY DR. W. ESTELL LEE
Philadelphia

With the unusual problems in the prevention and control of infection in wounds that have been forced upon surgeons during the present war have come equally unusual opportunities in the quantities and character of the material presented and the means for study.

After nearly three years of the war it would seem that the large majority of surgeons are agreed upon two cardinal principles:

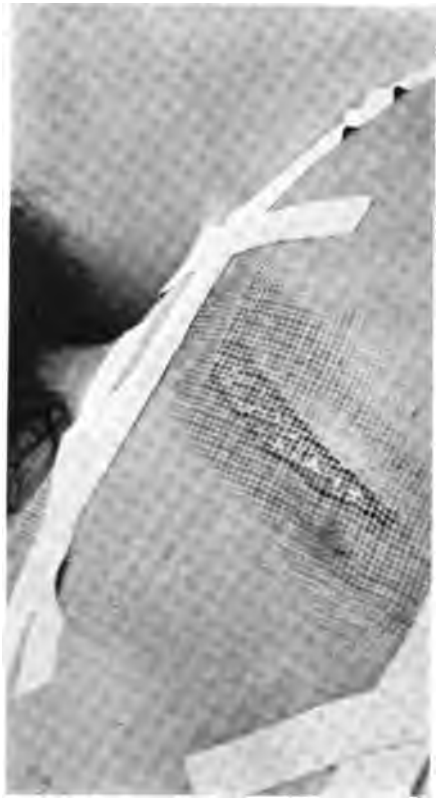
First.—The most important factor in the prevention and control of infection in military wounds is the interval of time elapsing between the receipt of the injury, which means infection in gunshot wounds, and the receipt of the proper surgical treatment. The incidence and virulence of infection in gunshot wounds definitely increases with delayed surgical treatment. A recent analysis of the work at the dispensary of the Pennsylvania Hospital has shown that this is certainly true with traumatic civil wounds. With the surgical factors exactly the same—surgeon, nurses, treatment, same class of patients, and similar injuries—when the primary treatment was received within the first half hour after the injury the average healing time was 6.5 days, while when this treatment was delayed, the average interval being six days, the period required for healing was 28.6 days.

Second.—Equally important in this problem of infection is the character of the surgery at the primary treatment. Unquestionably every effort at this primary operation must be directed toward obtaining the earliest possible closure of the wounds, immediate or secondary. The best method of obtaining this result continues to be a matter of controversy, but all military surgeons now realize that an open wound means inevitable infection; further, that infection means delayed healing, and delayed healing means scar tissue.

These surgical principles can and, we feel from our experience, should be applied to civil surgery. Our interest in the healing of

Digitized by Google

Fig. 1



A single layer of wide-meshed paraffined netting covering the burned area and a generous portion of the surrounding skin.

Digitized by Google

FIG. 2

Placing the gauze tampons, saturated with a 5 per cent. solution of dichloramine-T, in the incision, thus placing the germicide in contact with the infection and widely dilating the incision.

FIG. 3

The wound is covered with a light gauze dressing, two layers, which is changed whenever soiled.

Digitized by Google

infected civil wounds has been stimulated during the last year because in the readjustment of work necessitated by the mobilization of a large number of the surgeons of the hospital, the after-care as well as the primary operation upon infections and infected wounds has devolved upon us, and the application of these two surgical principles has certainly decreased to a large extent the labor and time usually required to obtain healing in this class of wounds.

The method used and results obtained in a series of twenty-seven carbuncles are typical of these changes.

With the patient under a general anæsthetic, deep crucial incisions are made through the carbuncle. These incisions extend beyond the periphery of the area of the infection and down to the deep fascia. In only one case have we undercut the triangular flaps, and in this case the resulting necrosis of the skin at the apex of each flap made secondary suture impossible. Arterial bleeding is ligated, and then from one to four gauze tampons, saturated with a 5 per cent. solution of dichloramine-T in chlorinated paraffin wax, are firmly packed into the incisions, one in each limb of the star-shaped wound in the large carbuncles (Fig. 2). Over this is placed a light gauze dressing, which is changed when soiled (Fig. 3). These tampons of gauze and germicide are introduced with the object of bringing a large mass of germicide in contact with the exposed surfaces of the infection and, at the same time, of widely dilating the wounds to insure the necessary access of the germicide to the infection at subsequent dressings. At the end of twenty-four hours these tampons are removed. In carbuncles up to two inches in diameter it is rarely necessary to repack with gauze, but with the larger ones several days of dilatation may be advisable. In areas under one inch the slough will frequently separate during the first twenty-four hours; in the 7½-inch one shown here it required ten days. The 5 per cent. solution of dichloramine-T is injected by means of a glass pipette and syringe into every accessible channel at each daily dressing. In the large carbuncle this was done twice a day until the slough had separated. As soon as the slough has separated everywhere, bacterial counts are made daily and, when they have remained as low as one in five fields for three successive days, closure of the incisions can be attempted. This secondary closure is not difficult if tried before the twelfth day, but after this cicatricial tissue rapidly forms and more or less tension in the sutures

Digitized by Google

is usually necessary to obtain approximation of the wound edges. Tension in the sutures is a cause of reinfection and should be avoided if possible.

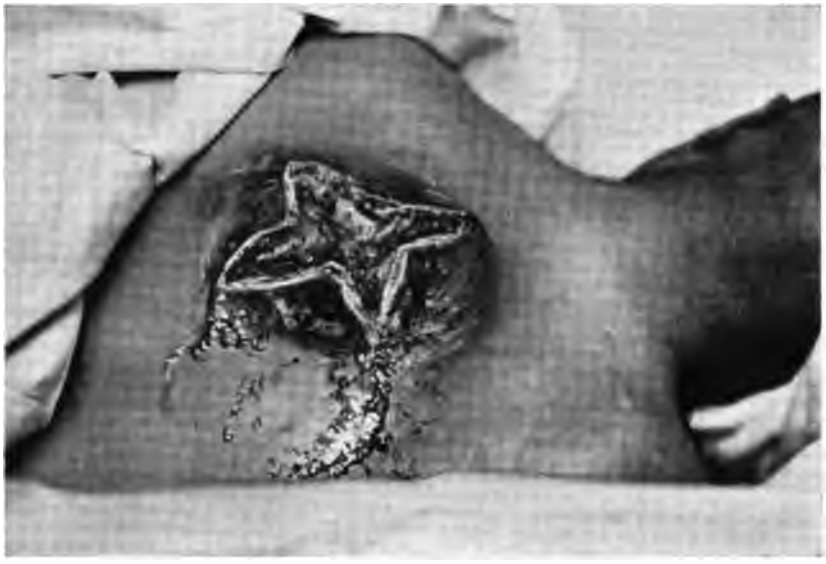
C. C., aged forty, an Italian laborer, was admitted to the Pennsylvania Hospital, December 6, 1917, with a carbuncle of the back. It began as a small pimple five days before admission; on admission it extended from one angle of the scapula to the other and measured 7½ inches in diameter (see frontispiece). The urine examination was negative.

Operation.—Crucial incisions, 8½ inches long and 3 inches deep, were made through and slightly beyond the infected area (Fig. 1). The arterial bleeding was controlled by catgut ligatures (catgut is not affected by dichloramine). Small gauze tampons were then placed over the infected surfaces of each triangular flap, and a fifth tampon in the centre of the cavity to insure full dilatation of the wounds (Fig. 2). The wound and adjacent area were then covered by a broad piece of gauze (two layers in thickness), which was held in place by several turns of a gauze bandage (Fig. 3). This gauze covering was renewed whenever soiled. During the first three days the gauze tampons were generously saturated with the same strength solution of the dichloramine-T every twelve hours. Each day the tampons were renewed, when the wound exudate was carefully mopped away with dry gauze pads, and the same strength of the dichloramine-T solution was injected by means of a glass syringe with a long pointed glass pipette into the many channels and pockets within the sloughing areas. The tampons were discontinued after the third day and the dichloramine-T solution injected every twelve hours until the tenth day, when the slough had entirely disappeared. At this time the bacterial count averaged one to a field, and the dichloramine-T was applied thereafter but once in twenty-four hours.

Attempts were then made to approximate the edges of the wound by pressure made by elastic bands (Fig. 5), with the result shown in Fig. 6 on the fourteenth day. The twenty-first day the skin and surfaces of the wound were cleansed with benzene and a 5 per cent. solution of dichloramine. With careful aseptic surgical technic the skin margins of the wounds were then excised and 60 per cent. of the edges of the incisions approximated by silkworm-gut sutures. Pri-

Digitized by Google

FIG. 4



Photograph of the paraffin mosquito-net dressing. Tampon changed twenty-four hours after operation.

FIG. 5

Approximating wound edges on tenth day by elastic bands.

Digitized by Google

Fig. 6

Results of four days' elastic pressure upon edges of wound.

Digitized by Google

mary union resulted. On the twenty-eighth day the skin and the unsutured portions of the wound were again prepared as at the first operation, after which the edges of the wound were approximated with silkworm-gut sutures (Fig. 7, thirty-first day). Unfortunately the wound was soiled by vomitus after this second operation and became infected, but over 90 per cent. of the approximated edges united and healed and only a small area in the centre, at the apices of each skin-flap, failed to unite and healed by granulation. On the thirty-eighth day he developed erysipelas in the region of the left axilla, some distance from the wound, but one exposure to the violet rays by Doctor Newcomer seemed to control this, and the only disadvantage was a slight prolongation of his stay in the hospital.

This patient was discharged, recovered, in seven weeks. We are still treating the granulating surface resulting from the complete excision of a carbuncle of the neck, four inches in diameter, eighteen weeks after the operation.

THE USE OF DICHLORAMINE-T IN THE TREATMENT OF SEVERE BURNS

Stewart's definition of an ideal dressing for severe burns is one "that would be (1) aseptic or (2) mildly antiseptic, (3) that would provide free drainage, (4) that would not macerate or (5) stick to the tissues and (6) would not necessitate frequent changing"; and there is still another that might be added: (7) that it should minimize the abnormal radiation of body heat from surfaces devoid of the protection of the skin and subcutaneous tissues.

We do not have at the present time any one method of treatment of burns in which all these conditions are attained. Wet dressings macerate and dry dressings stick. Ointments are not aseptic and can not be used in concentrations strong enough to be antiseptic, and, in addition to infecting the wounds, they form an impervious covering over their surfaces and prevent drainage of the secretions. Carron oil and all vegetable oils invariably infect the wounds and also prevent drainage.

Ambrine and the many forms of paraffin films now used meet some of the necessary requirements. They provide (1) aseptic and probably (2) slightly antiseptic dressings. Though at times painful on application, they (5) do not stick and can usually be painlessly and easily removed. (6) They do not require frequent

Digitized by Google

changing. (7) They do, to a certain extent, act as insulating coverings and decrease the radiation of the body heat from the wound area. But (3) they are impervious dressings and are deliberately designed to prevent drainage. Their object is to provide complete retention of the accumulating wound discharges from one dressing to another. As a result, (4) maceration of the tissues on the surface of the wound usually occurs.

The recent interest in the paraffin film treatment has, for the time being, induced many surgeons to abandon a method which for some time had given excellent results—the exposure of the burns to the air. The open-air treatment of burns more nearly meets the theoretical requirements of an ideal dressing than any other that has been proposed. (4) Maceration does not occur. (5) There are no adherent dressings to remove. (6) The question of the changing of the dressings is reduced to the absolute minimum, because no dressings are applied. (7) By keeping the patient under a canopy the temperature of the external air can be maintained at the body temperature and therefore there will be a minimum of radiation of the body heat.

Stearate of zinc is usually dusted over the surfaces of these wounds to act as a drying powder, but (2) no antiseptics are employed, because of the irritation they invariably produce. Scabs rapidly form under these conditions, and, unfortunately, infected exudate will collect beneath them, necessitating frequent removal. Thus (3) perfect drainage is not obtained. But the results are certainly as good as obtained by any other method, while the minute amount of dressings required is appreciated by the patient, nurse, and surgeon.

To this treatment of burns by exposure to the air we suggest the following modifications:

The covering of the entire burned area and a generous portion of the surrounding skin with a single layer of mosquito netting which has been previously impregnated with paraffin wax (see method of preparation *). The paraffined netting may be held in place by

* *Method of the Preparation of the Open-mesh Paraffin Netting Used in the Dressing of Burns and Large Wound Surfaces.*—This dressing has been designed to provide for the drainage of the secretions from wound surfaces and to avoid the sticking of the usual gauze dressings and the inevitable pain which accompanies their removal.

Digitized by Google

Fig. 7.

Digitized by Google

Digitized by Google

circular turns of a gauze bandage or adhesive strips applied over the netting and the uninjured skin (never over the burned area). Such a dressing is (1) aseptic, and the large open meshes provide (3) drainage for the wound discharges to the outer surface of the netting. Here they usually are rapidly dried by the contact with the warm air and form light scabs on the outside of the layer of netting. When this scab formation is sufficient to interfere in the slightest way with the drainage of the wound secretions, usually every twenty-four hours or longer, it is completely and almost painlessly removed by lifting the non-sticking paraffin layer of netting from the surface of the wound. The paraffined netting rarely adheres to the wound surface, but if it should a generous spraying with paraffin oil will quickly loosen it.

A good quality of mosquito netting with a mesh of one-sixteenth inch or fly netting with a mesh of three thirty-seconds inch is used.

As purchased, the netting is stiffened or "sized" with a starch compound, and we have found this is a decided advantage, for, if the starch or "sizing" is removed by washing, the thread will absorb too much paraffin and the mesh will be filled with the wax and will not allow the secretions of the wound to pass through.

The netting is cut into strips, four by six inches being a convenient size, and pieces are placed in muslin wrappers and made into a package, as is done with gauze sponges. These packages of netting are then sterilized in the usual way by steam under fifteen pounds' pressure.

Paraffin wax, melting between 40° and 50° C., ambrine, paresine, redintol, or cereline is then placed in a flat tray upon a water-bath. The tray should be about half filled with the melted wax.

When the wax is thoroughly melted, the previously sterilized netting, grasped at the two corners of one end by two sterile forceps, is slowly drawn through the melted wax.

The threads will quickly absorb the required amount of the paraffin in about one minute, and then the strip is held, by means of the same forceps, vertically over the hot surface of the melted paraffin until the excess of the wax has drained away and the mesh is everywhere open.

The strip is then moved away from the hot tray and held for a few seconds in the air to cool, after which it is placed in piles of ten in sterile muslin wrappers, as previously described.

Captain Furness has tested several combinations of paraffin and petrolatum, paraffin and liquid petrol, paraffin and beeswax, and plain beeswax as to their solubility by dichloramine-T and the chlorinated eucalyptol. In all combinations where petrolatum or liquid petrol or beeswax was used to make the paraffin flexible these substances were dissolved out of the wax, and the resulting dressing was not only soft but the remaining paraffin was thin and friable. Pure paraffin, paresine, redintol, and cerelene were unaffected by prolonged soaking in dichloramine-T.

Digitized by Google

The only remaining condition to be met in order to have the air treatment fulfil all the requirements of the ideal dressing is the use of an antiseptic. We have found that a 1 or 2 per cent. solution of dichloramine-T dissolved in chlorinated paraffin wax (after the method proposed by Dakin and Dunham *) can be used on burned surfaces without causing any objectionable subjective or objective irritative phenomena. This oily solution can be readily applied in the form of a spray (at the room temperature no heating is required as with the paraffin films) to the entire burned surface before the paraffin net dressing is applied and subsequently, through the meshes of the net onto the surface of the wound, if, for any of the above-mentioned reasons, it is unnecessary to remove the dressing.

We have employed this modified air treatment of severe burns of the third degree at the Pennsylvania and Germantown Hospitals during the last seven months upon fifty-five cases. With it we feel that because of the surprisingly small degree of infection occurring in these wounds they have healed more promptly and with a more satisfactory scar than with any other method we have employed.

Mary V., age eleven, was admitted to the Pennsylvania Hospital, December 16, 1917, suffering from severe third-degree burns of the face, neck, chest, abdomen, back, forearms, and hands. One-

* The instability of solutions of dichloramine-T in the chlorinated eucalyptol and paraffin oils led Doctor Dakin to search for another solvent, and by means of the chlorinated paraffin wax "Chlorcosane" a great many disadvantages of the former solvents have been eliminated.

"Chlorcosane" is a heavy oil prepared from paraffin wax by replacing part of the hydrogen in the compounds, contained in the wax, with chlorine. Those hydrocarbons which predominate in solid paraffin are designated by names ending in "Cosane" (*e.g.*, tetracosane, C_24H_50), so that the term chlorcosane indicates a chlorine derivative of this series without specifying any definite chemical constitution.

Preparation of the Solvent Chlorcosane.—Paraffin wax, preferably melting at 50° C. or higher, is placed in round-bottomed flasks and heated to about 120°. Two flasks connected in series, each containing half a kilo of wax, may be conveniently used. A rapid current of chlorine from a cylinder of the liquefied wax is then passed through the molten wax in the flasks, each of which is provided with a thermometer and the necessary glass tubes. The temperature should be controlled within the limits of 125° to 140°. The first flask, in which the reaction is most vigorous, will require but little heating. Chlorination is continued until the contents of the flasks have increased in weight 45 to 55 per cent. of the weight of the wax taken. It will be found convenient to complete the chlorination of the first flask and then remove it, and

Digitized by Google

Fig. 8

Photograph taken of right chest on the fourteenth day. The net dressing has been removed from the right side of chest for the daily dressing. Note the scab on the other half of the chest.

Fig. 9

Photograph of back taken on the fourteenth day. Dressing removed.

Digitized by Google

Fig. 10

Canopy of blankets over bed, which is supported on four crutches. Four electric light bulbs at foot of bed to maintain the required temperature of the air.

Digitized by Google

Fig. 11

Fig. 12

Photographs in Figs. 11 and 12 taken on the twenty-ninth day, fifteen days after photograph in Fig. 9. The back, except for the part shown in Fig. 12, was entirely healed, in spite of her having to constantly lie upon this area. The back had been treated from the beginning with dichloramine-T and the paraffin net dressing. The scar is mobile and entirely free from cicatricial tissue.

Digitized by Google

FIG. 13

Photograph taken on the seventeenth day, showing chest, abdomen, and axilla. Note the large dry scab that was allowed to form on the chest instead of using the net dressing, as was used on the right axilla and back.

FIG. 14

Photograph taken on the twenty-fifth day, showing left axilla and chest four days after the scab had been removed and the surface had been treated with the net dressing.

Digitized by Google

Fig. 15

Photograph of the right axilla and chest taken on the twenty-fifth day; wound entirely healed.

This photograph should be compared with that in Fig. 2. It was taken eleven days later. This area had been dressed daily with the paraffined net and dichloramine-T. In the area where scab formation was prevented by the daily removal of the exudate in the net dressing there was less infection and healing took place more rapidly. However, the area upon which the scab was allowed to develop was more deeply burned than the others.

Fig. 16

Photograph taken on the thirty-second day, showing the paraffined net dressing upon all the unhealed portions of the burned surfaces.

Digitized by Google

Digitized by Google

half hour before admission her clothes had been set afire by a gas stove. Unfortunately no photographs were taken until the fourteenth day after admission, for up to that time no one anticipated her recovery. To the illustrations (Figs. 8 and 9) third-degree burns of the entire face, eyelids, and neck should be added to obtain a picture of her condition at the time of admission.

A 2 per cent. solution of dichloramine-T in chlorinated paraffin wax (chlorcosane) was sprayed over the burned surfaces fifteen minutes after her admission to the hospital, and the wounds were then covered with the usual paraffined net dressing. The child was then placed under a blanket canopy (Fig. 10) and the wounds exposed to air warmed to a temperature between 85° and 95° F.

The usual shock encountered in such severe burns followed: the pulse was uncountable during the first forty-eight hours, but two ounces of urine excreted during the first three days, and the urine contained sugar until the ninth day. The temperature, however, was around 103° F. and did not show the usual picture of infection.

Photographic records of the case are being made at short intervals, and the few included in this preliminary report certainly show that the rate and character of healing are as satisfactory as obtained by any other method. In addition, we are certain:

---

transfer the second to its place, putting a fresh flask of paraffin wax after it. In order to avoid undue discoloration of the product, a minimum amount of rubber tubing should be used for the connections. Wide glass tubing should be used for passing the gases, and the ends of the delivery tube are preferably blown into bulbs provided with a number of fine orifices to promote good contact between the gas and oil. Hydrochloric acid is, of course, evolved during the reaction. After the requisite amount of chlorine has been absorbed, the oil, while still warm, is shaken vigorously with 5 per cent. of its weight of dry sodium carbonate and then filtered through dry fluted paper. The clear oil, which has a light yellow or sherry color and is slightly heavier than water, is then ready for use. It possesses a viscosity intermediate between that of olive and castor oil, has almost no odor, and is perfectly bland when sprayed into the nose on the skin or upon wounds.

Owing to the high viscosity of chlorcosane, it but slowly dissolves the antiseptic, dichloramine-T, at room temperature. To prepare a solution, it is advisable to proceed as follows: Warm about one-fourth of the required amount of chlorcosane to about 80° C., add the dichloramine-T, and stir or agitate with a glass rod until the solution is effected, then add the remaining three-fourths of the chlorcosane at the room temperature and filter, if necessary, through a dry filter-paper.—(*British Medical Journal*, January 12, 1918, No. 2976, p. 5, Haskin and Dunham.)

Digitized by Google

1. That the dressing and nursing care required for this case have been reduced to a minimum. With the exception of the primary dressing in the receiving ward, the treatment and dressing of the wounds have been entirely by the pupil nurses. During the entire course the dressings have been changed but once in twenty-four hours.

2. That the small amount of pain accompanying the daily removal of the net dressing has been an agreeable surprise to the patient and the nurse, and during the interval between the dressings she seems to be entirely free from pain.

3. The entire absence of exuberant granulations upon the still unhealed portions and the absence of contracting cicatrix (Fig. 12) in the healed areas, we feel, is because of the minimum amount of infection that has existed.

4. The results obtained in this severe case have been uniformly obtained in the other cases of this series.

Digitized by Google

THE TREATMENT OF SHELL AND GUNSHOT WOUNDS

BY HENRI BIGO, M.D.

Caudry, France

THERE is a very great diversity in both the aspect and evolution of injuries in war, according to their extent, depth, the structures involved, and the quality of the projectile. Certain wounds produced by a bullet traversing a limb or the body in full momentum are astonishingly benign. In some cases the projectile is lodged in the tissues in such a way that it is tolerated for a long time, but it would appear that this tolerance of the tissues has been somewhat exaggerated, writers having based their opinion of the practice in civil hospitals in times of peace.

Small projectiles, such as revolver bullets, often produce no inconvenience, and they are usually to be left alone; but there has been too great a tendency to generalize this idea and carry out an expectant treatment. Now, this attitude of some surgeons has already proved itself to be dangerous, as was made evident in the Balkan war, and it showed itself dangerous at the beginning of the present war, in 1914.

I do not wish to convey the idea that one should interfere in all cases of gunshot wounds, because there are sufficiently distinct indications to guide the surgeon according to the symptoms presented by the patient. It is certain that wounds of war offer the peculiarity of being exposed to infection by bacteria carried into the midst of the wound on bits of soiled clothing introduced at the same time as the projectile, but, if the wound is freely open and not irregular, simple treatment will be all that is necessary.

If the wound is anfractuous, infection can be controlled only by transforming it into a clean open wound. Now, if there is also the projectile in the tissues, which adds a mechanical irritation to that already set up by the bacteria, the first indication is to remove the foreign body. In a septic wound a foreign body is not tolerated. As Inspector General Delorm says in his "Précis de Chirurgie de

Digitized by Google

Guerre," 1914, page 60: *"The removal of metallic foreign bodies is particularly necessary, because they close the cul-de-sac in which the infected particles of clothing are found, and the removal of the metallic body is the best means of getting rid of the bits of clothing."*

I shall endeavor to show by cases that have been under my care that, under these circumstances, expectation has no other result than to prolong suppuration, while an early interference quickly brings about recovery. To demonstrate this, I shall consider the question under three headings: (1) Cases of largely open wounds, healing rapidly without complications, showing the natural tendency of wounds to undergo repair, and, in this case, the negative part played by the surgeon, which consists in watching and protecting the wound from external sources of irritation. (2) Cases of anfractuous wounds either neglected or treated by the expectant plan, with foci of hidden infection which keep up suppuration so long as they are not opened up and destroyed so as to enter into the first class of open wounds. (3) Cases of anfractuous wounds which by active treatment have been relieved of the infecting foreign body soon after their receipt and are transformed into open wounds with good drainage and rapid repair, which have benefited by an early interference.

This leads me to declare, with the exception of certain reserves drawn from indications offered in individual cases, that the surgeon, if he wishes to be conservative, should resort to surgical interference, which will be more efficacious and less serious if undertaken early.

I. FREELY OPEN WOUNDS

The bursting of modern shells easily produces vast wounds with loss of tissue. These cases are often not dressed at once on account of unfavorable circumstances, so that there is a long delay before they are attended to. Infection invariably ensues in a weakened and less resistant subject. However, in these freely open wounds recovery is very rapid as soon as the patient is placed in good conditions of rest and surgical care.

The same applies to similar wounds inflicted by bullets shot from a short distance and striking the skeleton in full momentum. The orifice of entrance may be insignificant, while that of exit is enormous, because the bullet, by splintering the bone, makes the splinters just so many secondary projectiles. A sort of natural drainage of

Digitized by Google

the wound is thus established, which, taken all together, assumes a funnel shape, so that the septic products can freely drain away. These facts are well illustrated in the following cases:

CASE I.—H., 7th Algerian Artillery, wounded September 16 by a bursting shell and remained one week on the battle-field before he could be rescued. Sent immediately to the hospital at Rouen, which he entered September 23, he presented a very large wound of the left leg which had denuded and torn the muscles of the calf. The wound surface offered a sphacelated color and gave off a foul odor. The wound was completely open, without any deep undermining of the tissues. In two days' time, by the use of prolonged baths of a hot potassium permanganate solution (4 to 1000), alternating with the application of wet dressings of the same solution, the odor disappeared and granulations began to develop. The patient left the hospital cured on November 6.

CASE II.—T., 251st Infantry, wounded on October 6 by a Mauser bullet, presented an open compound fracture of the right humerus.

The orifice of entrance of the ball was punctiform; that of exit was a vast gangrenous wound, including the entire internal surface of the arm. The wound was so extensive that it measured 15 centimetres in height by 20 centimetres in breadth. The shot had been fired at short range (less than 500 metres), and the humerus was broken in large splinters.

When the patient was admitted it was necessary to cut away a large number of ragged flaps of tissue which were gangrenous. Altogether, the wound looked bad and gave off a fœtid odor. However, after prolonged irrigation with oxygen water and cleaning with ether, it was decided to attempt to save the limb.

A prophylactic injection of antitetanic serum was given. Nine times daily the dressings, wet with a 4 to 1000 potassium permanganate solution, were changed, while twice daily a free irrigation of the wound was made with oxygen water, and then, with the help of a sort of impermeable sleeve made of gum taffeta, the entire limb from elbow to shoulder was placed in a bath. This immersion allowed the gangrenous strips of tissue to float in the solution, and while floating they were carefully pared away, the operation requiring not less than half an hour each time.

On October 17 a piece of the jacket of the bullet was extracted.

Digitized by Google

The wound cleaned up and slowly filled by normal granulation. The dressings were continued, likewise the immobilization, until December 1, at which date consolidation seemed sufficient, although, of course, there was a slight shortening. On January 2, 1915, mobilization and massage were begun.

The lesson offered by this case is that, in a patient presenting a serious general condition and a serious wound from the functional standpoint (since the possibility of amputation was considered), the prognosis is good if the wound is freely open and the treatment relatively simple, requiring only frequent dressings and ordinary medical care.

II. ANFRACTUOUS WOUNDS AND THE EFFECTS OF EXPECTANT TREATMENT

The satisfactory results obtained in the treatment of freely open wounds are more difficult to attain in anfractuous wounds. The characteristic feature of the evolution of these injuries when an inactive treatment is adopted is that they present latent periods, sometimes quite long, or apparent cure after a phase of more or less acute inflammation and profuse suppuration.

Under the influence of simple treatment, such as hot baths and moist antiseptic dressings, the inflammatory phenomena abate, while the suppuration diminishes and seems to cease. The improvement is such that a recovery is thought to have taken place and the patient is discharged as convalescent. But after a variable lapse of time suppuration recurs and the patient comes back to the hospital.

Then more complex lesions are found to exist on account of osteitis, periostitis, or the development of fungous tissue in the inflamed structures, with the usual congestive reaction common to prolonged suppuration and an organization of neoformed fibrous tissue.

At this time free incision seems inevitable, but it is not sufficient. It must be followed by a thorough cleaning out of the wound, and even then it is not certain that a sufficiently complete cleansing can be accomplished in one interference, so that a rapid union and complete recovery shall result.

There is, still more, to be taken into consideration the time first lost during the various peregrinations of the patient from the hos-

Digitized by Google

pital to the convalescent dépôt and *vice versa*. All this is important to the surgeon, because it devolves upon him to return as soon as possible all the men that he can; this condition the necessities of the service imperiously require.

The variations in the evolution of the wound, and, as a natural sequence, the prognosis and treatment, depend partly on the nature of the projectile. A bullet is generally well tolerated and rarely causes infection of the wound produced by it, provided it has not been deformed. As the bullets of shrapnel often present a roughened surface, they are not so well tolerated and especially become a cause of infection on account of the fragments of clothing that they carry into the wound.

As to bits of shell, they are never well tolerated and their presence in the tissues always is a source of suppuration.

The elements of prognosis may also be derived from the site of a wound. A wound of the soft parts, in full muscular structures, offers a remarkable tendency to repair. If the skeleton is involved, the fracture, which requires a longer time for repair, must be considered, likewise the presence of bone splinters which keep up suppuration.

Every para-articular wound requires close watching, because, independently of the always possible secondary infection of the joint, there is always an untoward result from the functional standpoint, and from the fact that a suppurative process requires prolonged immobilization.

What is particularly serious is the direct infection of a large joint, especially the knee, a question which has given rise to much discussion among military surgeons during this war. It is not only the time demanded for the treatment, or even the question of functional recovery, but there is also the agonizing problem *quoad vitam*.

In point of fact, statistics are deceiving when free incision has not been resorted to early enough, and the following cases will illustrate this point. In the military wards of the Hôtel-Dieu at Rouen we have had about twenty cases of penetrating wounds of the knee-joint. These patients arrived in different conditions. Some were sent directly from the battle-field; others came from auxiliary sanitary formations and were sent to us for serious complications. Therefore it is proper to make a distinction between these two types of cases.

Digitized by Google

On the other hand, I believe that the prognosis of wounds of the knee-joint should be regarded from a different point of view, according to the type of projectile which caused the wound. It is the almost unanimous opinion of all surgeons of experience that wounds resulting from bullets, whether Mauser or Lebel, are unquestionably less serious than those due to shrapnel, and the latter, in turn, certainly cause less havoc than a bursting shell. From this there arise important distinctions from the viewpoint of prognosis and treatment.

Finally, one must also take into account the presence of projectiles which have remained in the joint or in its immediate neighborhood. It is probable that in these circumstances the necessity for surgical interference will be still more absolute than in the case of a bullet which has gone through a joint and made its exit.

I will now first consider those cases in which operation had been postponed for various reasons.

Case III.—B., 355th Infantry Regiment. This man was wounded on September 16 in the right knee from shrapnel. On September 20 he was forwarded to the auxiliary hospital at Rouen, where he remained until the 29th of the month without any operation having been attempted. On this date he was taken to another sanitary formation especially used for fever cases and where all surgical treatment was lacking, because it was only after the lapse of one week that it was decided to incise the suppurating arthritis and drain the joint—for that matter, most defectively. His general condition became worse and the patient was sent to Hôtel-Dieu on October 31; in other words, six weeks after the receipt of the wound.

His general condition was very serious and the temperature high. The leg was semi-flexed, the knee global in shape. There were fistulous tracts on the inner and outer aspect of the knee, in which a small drainage-tube had been inserted. Radiography showed both halves of the shrapnel behind the lower end of the femur.

On November 3 a free incision extending up to the middle of the thigh was made over its external aspect, and free drainage with five large rubber tubes was made in the joint. Irrigations were practised and hot antiseptic moist dressings applied. The limb was immobilized in a gutter-splint.

On November 28 there was a severe secondary hemorrhage, and amputation of the thigh was decided on and performed at once. On

Digitized by Google

account of the purulent tracts and separation of the structures, which extended quite high up, it was necessary to shape a large posterior flap. The recovery was slow, and for some time the patient was very low and in a state of profound cachexia.

Slowly the condition improved. On January 20 about five centimetres of the end of the femur were resected on account of the projection of the end of the bone beyond the soft parts of the stump. The latter was properly made over and the patient is on the road to complete recovery.

In these cases the complications were the result of penetrating wounds of the knee-joint and were of serious nature. Among ten such cases four died; in three amputation of the thigh was required, while in two others a relative cure was effected; that is to say, with complete ankylosis of the joint. One patient was still seriously ill at the time of writing, and, even if a serious mutilating operation is not done, he will at all events only recover with a complete ankylosis of the knee.

I am of the opinion that the most serious factor in all these cases is the delay in resorting to a large incision and drainage of the knee-joint, but it would be unjust to attribute the septic and pyæmic processes to the operative delay alone. One must take into consideration both the nature of the projectile causing the injury and the location of the wound.

Besides these very serious cases, it is well to take note of instances of patients whose joints were not so seriously involved, presenting wounds of a mild character, which better explains the reason for assuming an expectant attitude. It will be of interest to note that in them the final fortunate outcome was delayed for a long time when the benign nature of the wound is taken into consideration.

Here is the first example in which no foreign body was in evidence and in which the patient was incapacitated for two months, during which he presented an interval of apparent cure from November 8 to the 17th; in other words, nine days.

Case IV.—G., corporal in the 21st Territorial, wounded October 15 by shrapnel on the anterior aspect of the left forearm and treated at a military hospital from October 18 to November 8, at which date he was transferred to the dépôt for convalescents at Hatry-Rouen. He next entered Hôtel-Dieu at Rouen, on November

Digitized by Google

17 for a lymphangitis, the starting-point of which was a wound "en seton," the remains of his injury.

After some moist dressings, on November 25 a free incision of the orifice of entrance was made, followed by curettement and dry dressings. Cure was complete on December 19.

The evolution of wounds becomes complicated if any foreign bodies remain in the tissues. They give rise to interminable suppuration. The following case is typical, the suppuration being kept up by shrapnel from August 21 to December 3:

Case V.—C., 74th Infantry, wounded August 21 in the right thigh from a bursting shell.

Treated at Abbeville for five days, was then transferred to St. Brieuc, where he remained from September 1 to November 8, and where extraction of the foreign body was done. He rejoined his corps, entered the infirmary, and after two weeks' observation was transferred to Hôtel-Dieu at Rouen, with the diagnosis of persistent fistula of the right thigh following a war injury.

Two radiographs (Nos. 2376 and 2377) showed the presence of a shrapnel ball at the bottom of the cul-de-sac of the fistula.

December 3, after incision of the fistulous tract, the projectile was removed, followed by curettement of the walls of the fistula and drainage by a counter-opening.

December 24, another free incision and complete exposure of the diseased tissues was done, followed by curettement and dry dressings.

January 10, patient in complete convalescence.

The following instance well shows that the indications for free exposure of the lesions are not always clear and that one must not wait for the development of serious symptoms before interfering.

Case VI.—B., 53d Infantry, wounded November 5 by a Mauser bullet.

Entered hospital on November 8, presenting a wound of the abdominal parietes in the cul-de-sac, the orifice of entrance being slightly to the right of the umbilicus. The tract of the wound was in a plane parallel to the integuments. Pus mixed with débris of the cap of the bullet made its escape at the opening. Examination with a probe showed that the tract measured about 8 centimetres, and that at the bottom there was a metallic body. There was a little subcutaneous emphysema.

Digitized by Google

November 12 the indication for a free exposure of the wound became evident, but there was some hesitation to transversely incise the muscular mass of the abdominal wall in nearly all its thickness, so that only a counter-opening was made 8 centimetres from the orifice of entrance. This allowed the extraction of a small bit of metal from the bottom of the cul-de-sac of the wound. A large drainage-tube was inserted in the tract.

December 1, a bit of the jacket of the ball was extracted through the orifice of the wound.

December 4, the wound was freely opened up under ethyl chloride anæsthesia and another piece of the projectile was removed. The wound was freely laid open throughout its entire extent. Dry dressings.

December 13, the bottom of the wound began to granulate and expel small bits of the jacket of the bullet.

December 20, another bit of the projectile was ejected spontaneously. Since that date the process of repair continued normally, and on January 10 cicatrization was complete. Patient discharged.

In the above-mentioned cases it becomes apparent that the process of repair and recovery commences only when one has become master of the infection of the wound. And to attain this end, if the wound is an anfractuous one, sooner or later, by one or several interferences, the dimensions of the wound must be increased and transformed in such a fashion that the flow of the septic products can take place freely and all retention done away with.

Since almost always the wound must be finally laid open by free incision, it seems clear that it is most advantageous to do this at once, without waiting for all the trouble which will surely arise. Now, in all the cases where the patient was placed in proper surroundings for an operation within the first week after receipt of the injury, and when he presented undoubted symptoms of infection, determining precise indications for laying the wound open, recovery has progressed with edifying rapidity when the slow progress made by the other cases is compared.

It would consequently seem to be an established fact that a certain number of wounded are very advantageously treated by an early interference. The number of cases of wounds successfully treated by early and free incision increases daily since this method has been

Digitized by Google

adopted in the Hôtel-Dieu, of Rouen. I have endeavored to select the most simple and striking examples for illustration, as I could not possibly go over all the numerous cases.

As an extension of the above-mentioned I may add the following instance to the list, as it represents an infected surgical wound closed by sutures:

Case VII.—D., 125th Infantry, wounded October 23 by a bursting shell. Treated at a division ambulance at Ypres, where amputation of the left thigh was done. The flaps were united by sutures. The patient was admitted to the hospital on November 8 with a profuse suppuration of the stump. (The patient declared that the dressings had not been changed for a fortnight.)

November 26, as the suppuration continued, drainage was further effected by two large drainage-tubes inserted in the anterior and posterior aspects of the thigh.

December 30, the suppuration had not completely ceased. Hot, moist dressings of a (1 to 4000) permanganate solution were applied. It was finally controlled.

The excellent results obtained by Surgeon A. Martin, of the Hôtel-Dieu, of Rouen, have led to the rule that in principle all doubtful amputation stumps should *not* be sutured, and by this means all chances of infectious complications are done away with. This is also the opinion of Surgeon Major Delorme, who says, in his book already referred to, that "*when infection of the stump is to be feared, the wound should be left open.*"

My own ideas are to be found exactly summarized in the conclusions of Gottschalk's excellent thesis (Paris, 1901), as follows: "*Antisepsis being inefficacious and dangerous, absolute asepsis unrealizable, the physical condition of the dressings should become an essential element in wound treatment; they should favor drainage of the secretions by assuring a current of continued exosmosis going from the wound to the dressing. The modern dressing should be regarded as a reunion of drains.*"

We logically deduct—and this is in conformity with facts that I have enumerated—that, if these conditions can be naturally realized in a wound, it only remains to protect and watch it. Such is the case of large open wounds. If, on the contrary, these conditions are not

Digitized by Google

realized from the nature of the wound itself, it is incumbent on the surgeon to produce them.

However, the peculiar character of certain wounds must be taken into account, such as "seton" or "tunnel" wounds produced by a bullet striking the parts in full momentum. Such wounds are not infected and heal spontaneously.

We have a very excellent example among the following five cases which are eminently suggestive if they are compared with the preceding case-histories of severe wounds of the knee from bursting shells.

Case VIII.—S., wounded November 2, entered the hospital on November 8. Mauser bullet had passed through the right knee. No serious symptom followed, as suppuration, and the proof of this is that on January 25 the patient walked quite easily and could flex the knee to right angle.

Case IX.—R., wounded November 2, entered the hospital November 8. A bullet had fractured the left patella and opened the joint, in which evidence of a collection was observed. No serious symptoms, probably because of the rapid spontaneous closing of the joint serous membrane.

On January 27 the patient was well and could bend the knee to a right angle.

Case X.—B., German prisoner, wounded October 30 by a Mauser bullet, transferred to the hospital November 7. The wound was located five centimetres above the joint interline; bits of clothing had been carried in with the projectile, which is embedded in the femur. Free suppuration.

November 10, the bullet and pieces of clothing were removed. Free drainage by a counter-opening on the antero-external aspect of the knee. General condition remained good.

January 26, only a fistulous tract existed. The joint had preserved all its movements.

Case XI.—D., German prisoner, wounded October 23, entered the hospital November 7. A Lebel bullet went through the knee-joint from the upper border of the patella to the popliteal space. The vertical tract immediately cicatrized with astonishing rapidity. The patient developed only an hydrohæmarthrosis. Compression and immobilization of the joint were resorted to.

Digitized by Google

January 27, patient nearly well, with almost complete movements of the knee-joint.

Case XII.—B., 317th Infantry, wounded September 8, entered the hospital September 12 for a gunshot wound of the left knee and splintered fracture of the patella. The orifice of entrance of the projectile was in the left calf, that of exit a little above the patella. On his arrival the patient's general condition was satisfactory.

The knee-joint was opened and drained thoroughly by a counter-opening at the internal aspect of the knee.

October 13, drains removed.

November 27, incision of a pus collection.

January 28, presented a purulent fistula on the external aspect of the knee. Ankylosis was almost complete, but the general health was satisfactory.

These last five cases are certainly more consoling as to the outcome, as they were all serious injuries, but the general condition of the patients was at no time alarming. Three patients may perhaps be able to return to the front (Cases VIII, IX, and X), because their joints have retained most of their movements. Finally, two others at length recovered with a total or partial ankylosis of the knee, without any serious complications.

If we look for the reasons for the difference of the results obtained in the latter five cases as compared to the others reported, I think they may be found in the following circumstances: In the first place, in the latter cases the projectile was either a Mauser or a Lebel bullet instead of shrapnel or metal splinters from a bursting shell, and this accounts for the lesser infection.

The anteroposterior intra-articular track followed by the projectile favored an immediate drainage of the wound by a perfect decline plane in Cases XI and XII, while in Cases VIII and IX there was at no time even the slightest momentary retention of any septic serous fluid, and therefore cicatrization took place rapidly.

Although it may seem paradoxical, the fractures of the patella did not increase, but rather, on the contrary, decreased the gravity of the prognosis. This is certainly true of Cases VIII, IX, and XII, and in my opinion this relatively simple state of affairs is due to the fact that the joint was quite largely opened and properly drained.

Digitized by Google

Briefly, fracture of the patella particularly favored immediate drainage of the upper cul-de-sac of the joint.

Whatever may be thought of these cases, it is important to determine, from the viewpoint of treatment, the indications most susceptible of quickly and efficaciously controlling the serious complications which are occasioned by wounds of the knee-joint, and in my opinion these indications are:

1. Temporize in a gunshot wound of the knee. Immediate immobilization of the joint and surgical interference later on if there is the slightest rise in temperature or any local reaction.

2. Immediate interference for each and every wound produced by shrapnel or bits of bursting shell.

The interference consists of large and free incision of the orifices of entrance and exit of the projectile and deep drainage with rubber tubes if later any evidence of intra-articular suppuration appear.

By an immediate interference I mean one which is undertaken when the patient arrives at the ambulance, and this is why I believe that it would be useful to furnish the sanitary formations at the front with proper instruments and a surgical personnel capable of performing the necessary surgical interferences in question with all the clinical and technical care that is only to be found among trained surgeons. The same applies to other operative work, particularly the brain and the major traumatisms of the limbs.

3. In case of fever and manifest inflammatory reaction in the knee a large V-shaped flap should be made on the anterior aspect, raising it up, with the patella included in it, so as to freely open the joint and thoroughly expose it.

Immobilize the knee with a special apparatus which allows irrigations and changes of dressings to be accomplished easily without disturbing the limb.

Such an operation, no matter how radical it may appear, will not, *per se,* cause more functional impotency than a long suppuration. In both cases ankylosis of the joint is inevitable. But this is about the best outcome that can be hoped for when suppuration has become installed in the knee-joint, and it is preferable to obtain an ankylosis too soon than too late.

4. Amputation of the thigh will, of course, be only an ultimate resource in desperate cases in which the life of the patient is in

Digitized by Google

jeopardy, and should never be undertaken until all other therapeutic measures have been found futile.

The majority of the cases here reported prove that it is not an exaggeration to generalize the preceding indications and to make them the rule of conduct of the surgeon in all wounds produced by shot or shell.

It appears that free incision and laying open the wound are clearly indicated in infected anfractuous or fistulous lesions, and time will be saved if this is done early in the process.

I do not wish to convey the idea that every wound should be incised in all cases and without exercising good judgment, but, at all events, a needless incision can never be a serious matter nor delay recovery to any appreciable extent. Every wound received in battle must be looked upon with suspicion from the viewpoint of infection, and the only condition which will avoid sepsis is a free opening of the joint, followed by proper drainage, and the earlier this is done the better.

Digitized by Google

A General Review of Medicine for the Year 1917

BY FRANK A. CRAIG, M.D., AND P. G. SKILLERN, JR., M.D.

PUBLIC HEALTH AND INDUSTRIAL MEDICINE

WITHIN the past few years there has been a striking increase in the interest in public health questions, especially in regard to the problems of preventive medicine. That this subject has only recently received the attention its importance would warrant is clearly shown by Vincent (*Jour. Amer. Med. Assoc.*, April 7, 1917, lxviii, No. 14, p. 1013) and by Rosenau (*Jour. Amer. Med. Assoc.*, June 2, 1917, lxviii, No. 22, p. 1613). These writers give a careful consideration of the public health teaching in our medical colleges and universities as it is conducted at present, and offer valuable suggestions as to the lines upon which such a course should be developed. The number of articles upon public health matters appearing in the general medical journals is noticeably on the increase. There can be no question of the enormous value to the public welfare which must result from the interest developed in these questions of public health.

One of the greatest difficulties confronting every municipal health board is the securing of an appropriation of sufficient size to carry out the most superficial health measures. This defect will never be corrected until the public has been educated in general health problems to that extent that they will demand better handling of public health matters. In view of the fact that the money is usually limited to a certain amount, the question which must frequently arise is, "How may this money be expended to bring in the greatest return in public health?" The relative value to the community of the various public health procedures is the subject of an article by Chapin (*Jour. Amer. Med. Assoc.*, July 14, 1917, lxix, No. 2, p. 90), who gives, on the basis of 1000, the relative value of such measures as Vital Statistics, Education, Laboratory, Food Sanitation and Adulteration, Nuisances, Infantile Mortality, Contagious Diseases, and Tuberculosis.

Digitized by Google

While naturally the problems in different localities vary greatly, the article is of value as forming the basis for apportioning the funds available for municipal health measures. Armstrong (*Jour. Amer. Med. Assoc.,* January 13, 1917, lxviii, No. 2, p. 103) discusses the sanitation of public markets in an article which is especially timely in view of the fact that the public is at present extremely interested in the subject of food from various standpoints.

Within the past few years the employers of labor have begun to appreciate the economic value of the health of the laborers. The realization of the mutual benefit to both employer and employees of the various measures directed toward the betterment of living and working conditions has opened up a new field in medicine for those specially equipped with the training and practical experience necessary to put in practice the general theories of hygiene as they are peculiarly applicable to industrial conditions. The machinery necessary for the efficient handling of large bodies of laborers can be used for the furthering of preventive medicine and surgery, and will undoubtedly prove a greater help in advancing this branch of medicine than any other measure which could possibly be devised. The manner in which the health supervision of the employed works out in practice may be learned from an article by Mock (*Jour. Amer. Med. Assoc.,* January 6, 1917, lxviii, No. 1, p. 1), who shows that if preventive measures are followed out in regard to wounds by the immediate application of tincture of iodine, less than two-tenths of one per cent. become infected. He also calls attention to the fact that the examination of employees and applicants for positions may lead to hardships in the 3 to 5 per cent. who are physically unfit. The problem of what to do with the small proportion of the population who are physically unfit he considers must be solved by state regulations. That the industrial dispensary may be of value in the prevention as well as in the treatment of disease is the belief of McCurdy (*Jour. Amer. Med. Assoc.,* October 20, 1917, lxix, No. 16, p. 1318). The problem of what constitutes a defect in a prospective employee naturally varies with the character of the work to be performed. Clark (*Jour. Amer. Med. Assoc.,* January 6, 1917, lxviii, No. 1, p. 5) gives in detail the defects discovered, and which have or have not led to rejections, in the applicants for positions during five years' experience in a large factory, the causes for rejection varying

Digitized by Google

with the character of the work to be performed in the different departments. The economic side of the problem is carefully considered by Lemon (*Jour. Amer. Med. Assoc.,* January 13, 1917, lxviii, No. 2, p. 95), who lays special emphasis upon the benefits and financial success attending the formation of a mutual beneficial association among employees of a street railway company.

There is another side to the industrial welfare problem in addition to that of promoting the general health and well-being of the workers; namely, the prevention of accidents, poisoning, or disease as a direct result of the work itself. It will be of the greatest interest to see whether the various campaigns of education of the workers in regard to the dangers to be avoided, by means of "Safety First" posters and lectures, will show a material reduction in the number of industrial accidents resulting from carelessness. Every industry in which machinery is employed exposes the employees to injury, although numerous safety devices have been suggested to overcome the more obvious dangers. Much more insidious are the poisons which may develop in the various processes of manufacturing where chemicals are employed. The relation between the symptoms and the poisoning is not easy to determine in many instances, unless the signs of intoxication are peculiarly characteristic. In an article on industrial diseases Pometta (*Correspond.-Blatt für Schw. Aerzte,* February 3, 1917, xlvii, No. 5) calls attention to the fact that there is scarcely any sickness from industrial poisons that can not develop, with about the same group of symptoms, from some entirely different cause.

During the past year special attention has been called to *brass founders' ague,* or "spelter chills," by Riesman and Boles (*Amer. Jour. Med. Sc.,* March, 1917, cliii, No. 3). Anilin poisoning is occurring with greater frequency with the increase in anilin dye factories. It is important, therefore, that one should be familiar with the modes of intoxication, symptoms, and treatment of this form of poisoning. Lintz (*Jour. Amer. Med. Assoc.,* March 3, 1917, lxviii, No. 9, p. 692) reports a case of anilin poisoning and calls attention to similarity between the symptoms of poisoning with anilin and nitro-benzene. The increase in the manufacture of munitions in this country has emphasized the importance of recognizing the poisonous substances which may develop from the manufacturing of explosives. Dr. Alice Hamilton (*Jour. Amer. Med. Assoc.,* May 19, 1917, No. 20,

Digitized by Google

p. 1445) has made a study of the *industrial poisons* encountered in the manufacture of explosives at the request of the United States Bureau of Labor Statistics, visiting forty-one plants in which there were about 30,000 people employed. The three poisons causing the largest number of deaths were nitrogen oxide, trinitrotoluene (T.N.T.), and benzene. Other poisons which may produce toxic symptoms are nitro-benzene and toluene, ether, anilin, fulminate, and picric acid. The most serious, so far as frequency with which it occurs, of these poisons is nitrogen oxide, with T.N.T. a close second. The latter compound is of special interest because it is only in recent years that it has been employed and therefore its toxicity and symptomatology are not so well understood. The chemistry, method of entrance to the body, symptomatology, pathology, and treatment have been concisely stated in the *Journal of the American Medical Association,* February 10, 1917, page 459. The pallor, dermatitis, anæmia, abdominal symptoms, and jaundice seem to form a fairly characteristic group of symptoms with which every practising physician should be made thoroughly familiar. The development of a hæmolytic aplastic anæmia, either with or without the presence of jaundice, associated with atrophy of the liver, should suggest the possibility of T.N.T. as the toxic agent. A study of the blood in these cases has been made by Panton (*Lancet,* London, 1917, 2, 77).

MERCURIC CHLORIDE POISONING

The increasing number of bichloride of mercury poisoning cases (707 such cases are reported as occurring between January 1 and June 30, 1917, by M. G. Motter, in a letter to the *Journal of the American Medical Association,* July 14, 1917) adds special interest to the newer methods of treating this condition. Especially encouraging is the fact that cases which would be considered hopeless under the older methods have responded to the newer lines of treatment. The various studies of the systemic effect of mercury in toxic doses have formed the basis for the more rational and scientific treatment of these cases, which promises much more satisfactory results than the previous empirical methods.

The Lambert method of treating mercurial poisoning, as this method of treatment has been named, is based upon the fact that mercury is usually excreted by the mucous membrane of the stomach

Digitized by Google

and intestines for a prolonged period after the ingestion of the poison, as has been shown by Lieb and Goodwin (*Jour. Amer. Med. Assoc.*, June 19, 1915, p. 2041). Since the original report of Lambert and Patterson (*Arch. Inst. Med.*, November, 1915, p. 865) considerable valuable information in regard to the effect of the poison upon the kidneys has been added by the investigations of Lewis and Rivers (*Bull. Johns Hopkins Hosp.*, 1916, 27, 193).

Briefly summarized, the treatment consists in the following: Prolonged gastric lavage and colonic irrigation with warm water, continued until the stomach washings and the urine show no trace of mercury. Diuretics in the form of a mixture of potassium bitartrate, sugar and lactose, and potassium acetate by proctoclysis. Daily hot-packs to stimulate excretion by the skin.

The method of Vogel and Lee (*Jour. Amer. Med. Assoc.*, February 14, 1914, p. 532) may be employed for detecting the presence of mercury in the excretions. Elliott (*Jour. Amer. Med. Assoc.*, June 9, 1917, p. 1693) has described a method which he considers extremely delicate (one fifteen-thousandth mg. of mercury in 500 Cc. of distilled water) and relatively simple. The gastric lavage and colonic irrigation may be given two or three times daily, employing large quantities of warm water. For the proctoclysis by the continuous drop method one drachm of potassium acetate in one pint of warm water has been recommended. The diuretic mixture employed by Brown and Baskett (*Jour. Amer. Med. Assoc.*, June 2, 1917, p. 1622) consisted in the following: Potassium bitartrate, 1 drachm; sugar, 1 drachm; lactose, ½ ounce; lemon juice, 1 ounce; and water, 16 ounces—eight ounces being administered by mouth every second hour. Weiss (*Ohio State Med. Jour.*, September, 1917, xiii, No. 9) uses the following: Cream of tartar, 4 Gm.; sodium citrate, 2 Gm.; and sugar, 2 Gm., with lemon or orange juice to taste, to 8 ounces of water—the cream of tartar and sodium citrate being added to the lemonade just before using. He gives eight glasses of this mixture daily.

The administration of alkalies is based upon the investigation of Macuider (*Jour. Exper. Med.*, 1916, 23, 171), who has shown that they are capable of protecting the kidneys from the full renal effects of heavy metals like uranium which induce nephritis in a manner similar to that of mercury. He has shown that the acute kidney

Digitized by Google

injury which develops late in mercuric chloride poisoning does not bear any definite relation, in the frequency with which it occurs, to the severity of the mercuric enteritis. The degree of acid intoxication which is constantly associated with acute mercuric chloride intoxication shows a definite relation to the severity of the damage to the renal tissue.

Lewis and Rivers (*Bull. Johns Hopkins Hosp.*, 1916, 27, 193) recommend the administration of carbohydrate in the form of glucose, 10 to 50 per cent., solution either by mouth or intravenously, which serves as a mild diuretic and is believed to exert a protein-sparing action, delaying the appearance of extreme nitrogen retention which usually precedes death. Milian (*Paris Med.*, September 1, 1917, vii, No. 35) reports very striking results from the intravenous administration of hypertonic glucose solution (60 Gm. of glucose in 200 Cc. distilled water) in a patient suffering from mercurial anuria.

Weiss (*Jour. Amer. Med. Assoc.*, June 2, 1917, p. 1618) describes a method of treating mercuric chloride poisoning which is similar to that of Lambert and Patterson, except that the frequent gastric and colonic irrigation is omitted. In addition to the potassium bitartrate mixture previously mentioned, he employs Fischer's solution (sodium carbonate crystals, 10 Gm., and sodium chloride, 15 Gm., to 1000 Cc. of water) intravenously, in quantities varying from 1000 to 1500 Cc., depending upon the condition of the patient's heart. Cases presenting no cardiac derangement tolerate the 1500 Cc. of solution without any disturbance.

In the treatment of these cases considerable valuable information may be obtained by a study of the phenolsulphonephthalein curve and the specific gravity of the urine. A marked fixation of the specific gravity of the urine at a low level has been shown by Mosenthal (*Arch. Int. Med.*, November, 1915, 16, 733) to occur in only the severest types of nephritis. As the renal function approaches normal the variations in the concentration of the urine, as expressed by its specific gravity, become more and more conspicuous.

In advanced cases of mercuric chloride poisoning Wilms (*Jour. Lab. and Clin. Med.*, 1917, ii, 445) believes that the intravenous injection of calcium sulphide solution, grain for grain of the bichloride of mercury taken, is the safest and most rapid method of treatment. When the intravenous method is not practicable, he states

Digitized by Google

that calcium sulphide may be administered by the mouth. He presents clinical and experimental evidence to support his belief that calcium sulphide is the quickest, simplest, and surest antidote for mercurial poisoning at the present time. The various antidotes employed in mercurial poisoning have been made the subject of an experimental study by Fautus (*Jour. Lab. and Clin. Med.*, 1916, i, 879). On the basis of this investigation he recommends immediate administration of a tablet composed of sodium phosphite, 0.36 Gm., and sodium acetate, 0.24 Gm. If this is not available, give the following: Sodium hypophosphite, 1.00 Gm.; water, 10.00 Cc., and hydrogen peroxide, 5.00 Cc. If the amount of the poison be known, ten times as much of the hypophosphite should be given as poison was taken. As this might require a large and possibly harmful amount of hypophosphite, it should immediately be followed by copious lavage, with a very dilute solution of the antidote. This may be followed by a safe dose of the antidote, which may be retained and repeated every eight hours for several days. This treatment might be combined with some such eliminant treatment as recommended by Lambert and Patterson.

ACUTE ANTERIOR POLIOMYELITIS

The natural result of such a severe epidemic of acute poliomyelitis as the one attacking the eastern portion of the United States during last year is the appearance in the medical literature of a large number of articles dealing with various phases of the disease. In the absence of direct experimental evidence the statistical studies are of value, as they supply data upon which one may base conclusions as to the method of dissemination of the disease, period of incubation, preventive measures, necessity of quarantine, etc. Herrman (*Jour. Amer. Med. Assoc.*, July 21, 1917, lxix, No. 3, p. 163), from a study of the epidemic in New York City, believes there exists a distinct individual predisposition or susceptibility, which is much less in children under thirteen years of age than to the other communicable diseases of childhood, being present in only about 2 per cent. of children. He further states that a future epidemic could be controlled if we had a method of detecting the 2 per cent. of susceptible children and could immunize these against the disease with convalescent serum. Craster (*Jour. Amer. Med. Assoc.*, May 26, 1917,

Digitized by Google

lxviii, No. 21, p. 1535) concluded, from a study of the disease in Newark, that epidemic poliomyelitis appeared to be a disease carried directly from place to place by some human carrier not yet possible of identification. He believes that infection by direct contact, although possible, is not probably the commonest way of infection. Shaw (*Jour. Amer. Med. Assoc.*, July 21, 1917, lxix, No. 3, p. 167) believes that "we have learned from this recent pandemic that poliomyelitis is transmitted by contact with a patient or a carrier; that the period of incubation averages seven days, and that three weeks is a sufficient period to hold a patient with poliomyelitis in quarantine." Some interesting observations bearing on the question of the transmissibility of the disease by the diseased to the unprotected individual by human contact; the part played by the innocent in the transmission of the disease, and the proportion of healthy children who are susceptible, are presented by Kerley (*Arch. Pediat.*, 1917, xxxiv, 32). He believes that poliomyelitis may be communicated by direct contact and by innocent carriers, and that only 5 to 10 per cent. of children are susceptible to infection. From the experiments of Noguchi and Kudo (*Jour. Exper. Med.*, July, 1917, xxvi, No. 1, p. 49) it would appear that it is improbable that the virus of poliomyelitis is taken up by mosquitoes or by fly larvæ. Not only does the virus fail to multiply, but probably is rapidly destroyed within the body of the insects. They also point out that the experiments of Rosenau and Brues in 1912 were of a different character, the insects in those tests being shown to act as mere mechanical carriers of the virus and not as intermediary hosts. A general outline of our present knowledge in regard to the nature and mode of infection of epidemic poliomyelitis is contained in an article by Flexner (*Amer. Jour. Med. Sc.*, February, 1917, cliii, No. 2, p. 157). The committee on poliomyelitis of the Conference of State and Provincial Boards of Health which met in Washington, D. C., April 30, 1917, has suggested certain minimum requirements for the control of the disease which were unanimously adopted (*Jour. Amer. Med. Assoc.*, June 30, 1917). This report deals with the questions of quarantine, disinfection, etc., in detail. Emerson (*Amer. Jour. Med. Sc.*, February, 1917, cliii, No. 2, p. 160) contributes an article dealing with some practical considerations in the administrative control of epidemic poliomyelitis, based on his experience as commissioner of health of

Digitized by Google

New York City during the recent epidemic. Alfaro (*Prensa. Med. Argentina,* August 20, 1917, iv, No. 8, p. 98), from a study of 60 cases seen during the past few years, states that he has never seen or known directly of a case of contagion, nor has he been able to trace the cases through a carrier to the source. He therefore does not believe in the excessively severe prophylactic measures which some have wished to introduce in Argentina.

The organism causing acute anterior poliomyelitis is still the subject of dispute between two groups of investigators. The "globoid bodies" discovered by Flexner and Noguchi were accepted as the cause of this disease; recently, however, numerous observers have reported the finding of cocci in these cases, with evidence pointing to these organisms as the etiologic factor. During the past year Amoss (*Jour. Exper. Med.,* 1917, xxv, 545) has reported the results of an investigation which confirms the findings of Flexner and Noguchi, and seems to cast doubt upon the findings of the other group of investigators. Bull (*Jour. Exper. Med.,* 1917, xxv, 557) repeated the experiments of Mathers, Herzog, Nuzum, and Rosenow, who claim to have produced poliomyelitis clinically and pathologically by the inoculation of streptococci into laboratory animals. His results were widely different from those of the previous authors, the animals merely developing lesions ordinarily resulting from streptococci inoculations, being in no instance similar to the lesions peculiar to poliomyelitis. Mather (*Jour. Infect. Dis.,* January, 1917, xx, No. 1, p. 113) reports the finding of a peculiar polymorphic, streptococcus-like organism in nine out of ten cases of poliomyelitis, seven times in pure culture. He believes the character of the coccus thus far determined indicates that it is an important factor in the disease. The work upon which he bases his opinion, Hektoen (*Bost. Med. and Surg. Jour.,* May 10 and 17, clxxvi, Nos. 19 and 20) believes, is not conclusive, although the micrococcus appears to have many properties in common with the virus of the disease and with the minute organism described by Flexner and Noguchi. Greeley (*Bost. Med. and Surg. Jour.,* April 12, 1917, clxxvi, No. 15, p. 540) reports the finding of an organism which corresponds serologically and culturally with that described by Rosenow; and Gauss (*Jour. Amer. Med. Assoc.,* March 10, 1917, lxviii, No. 10, p. 779) reports the isolation of an organism in one case of poliomyelitis resembling the form described by Nuzum. The

Digitized by Google

pathologic investigation of Blanton (*Jour. Med. Research,* 1917, 36, 1) would also appear to confirm the view of the group which view "cocci" as the causative agent. While it would seem almost impossible to reconcile the views held by these two groups of observers, the work of Rosenow and Towne (*Jour. Med. Research,* 1917, 36, 175) suggests that there is a possibility that they may be describing the same organism, which may possess varying characteristics under different conditions and circumstances. For the sake of truth and knowledge it is to be hoped that this possibility of pleomorphism will be decided some time in the near future, as it appears to be the only ground upon which an agreement could be brought about between the two groups.

That the nasal washings contain a water-soluble substance which possesses the power to inactivate or neutralize the active virus of poliomyelitis is reported by Amoss and Taylor (*Jour. Exper. Med.,* April, 1917, xxv, No. 4, p. 499, and *Vermont Med. Jour.,* August, 1917, 11, No. 8, p. 189). It is uncertain whether actual invasion of the virus and production of infection may be prevented by this property. The authors suggest that probably this property is merely accessory and not the essential element on which defense against infection rests.

All preventive measures, and in large measure therapeutic procedures, are dependent upon or greatly enhanced by early diagnosis. If we must accept the view that a very large proportion of the cases are not accompanied by paralysis, we must reconstruct our ideas in regard to this disease. Martin (*Canadian Med. Assoc. Jour.,* 1917, vii, 113) states that the *prodromal period,* if present, shows indefinite body pains, fatigue, and pressure or aching of the head. The onset shows a high fever of short duration and usually ending by lysis. The general symptoms are headache, vomiting, constipation, pains generally over the body, but particularly in the nape of the neck; stiffness of the head and neck and refusal to flex the chin on the breast, diffuse hyperæsthesia, weakness, flaccid muscles, and drowsiness. These symptoms may last for five to ten days, followed by rapid recovery, when the case is termed "abortive." This abortive type constitutes 35 to 56 per cent. of all cases and is the most dangerous form, from the point of dissemination of the disease. He states that during epidemics every person with an acute infection is rightly

Digitized by Google

to be regarded as a suspect. Ayer (*New York State Jour. Med.*, August, 1917, xvii, No. 8, p. 368) believes that the early stage of the disease is characterized by a distinct clinical picture, and that, in the presence of an epidemic, any case presenting with headache, fever, and rigidity of the neck should be considered a case of poliomyelitis until proved otherwise. Ruhräh (*Amer. Jour. Med. Sc.*, February, 1917, cliii, No. 2, p. 178), in a comprehensive article, described the various clinical types of the disease, the points of value in diagnosis, and the various conditions from which it must be distinguished. The examination of the spinal fluid, as a means of establishing an early diagnosis, has been carried out by several observers. Abrahamson (*Jour. Amer. Med. Assoc.*, February 17, 1917, lxviii, No. 7, p. 546), from a study of 1200 fluids, believes that there is present little, if any, virus demonstrable either by culture or animal inoculation in the spinal fluids of human poliomyelitis in the early stages. Overholser (*Bost. Med. and Surg. Jour.*, October 4, 1917, clxxvii, No. 14, p. 480) found that in the early post-paralytic stage the spinal fluid usually showed a moderate lymphocytosis and a slight to moderate increase in pressure and in globulin content. Fehling's solution is reduced, but this phenomenon is of little diagnostic value. A reasonably constant curve is yielded by Lange's colloidal gold test; this curve has some value in the differential diagnosis. The picture is only fairly constant, and he believes that, in the absence of positive clinical findings, it does not justify a diagnosis. Felton and Maxcy (*Jour. Amer. Med. Assoc.*, March 10, 1917, lxviii, No. 10, p. 752) believe that the gold chloride reaction is helpful in the diagnosis of the disease, as the spinal fluid in acute poliomyelitis reacts constantly in the same zone. During the acute stages of poliomyelitis Kolmer, Freese, Matsunami, and Meine (*Amer. Jour. Med. Sc.*, November, 1917, cliv, No. 5, p. 720) found that the spinal fluid in 40 to 50 per cent. of the cases yielded a colloidal gold reaction of the luetic and meningitic zone types. They state that "a definite and absolute diagnostic criterion or laboratory test with the cerebrospinal fluid in acute anterior poliomyelitis has not been discovered. A clear or slightly opalescent fluid flowing under increased pressure, sterile as examined by smear and culture when collected aseptically, poor in fibrin, reducing Fehling's solution, and containing an increased number of cells, chiefly of the mononuclear

Digitized by Google

variety, are the most constant findings. An increase of protein and a high potassium permanganate reduction index strengthen the diagnosis, while a colloidal gold reaction of the luetic and meningitic zone types and the presence of natural antisheep hæmolysin are helpful diagnostic data."

That the meningeal chorioid plexus plays an extremely important rôle in preventing infection with the virus of poliomyelitis, and that immune serum is of value in offsetting the disadvantages and dangers arising from defects in the mechanism, is apparent from the experiments of Flexner and Amoss (*Jour. Exper. Med.*, April, 1917, xxv, No. 4, p. 525). They also found (*Jour. Exper. Med.*, April, 1917, xxv, No. 4, p. 449) that the cerebrospinal fluid taken very early and quite late in the course of acute poliomyelitis exhibits no neutralizing action on filtered poliomyelitis virus. The blood-serum on the sixth day of disease already contains the neutralizing principles. They state that it is established for monkeys and rendered probable for man that the intraspinal injection of immune serum in poliomyelitis is curative. The injection of sterile horse serum into the cerebrospinal meninges in monkeys increases their permeability so that they permit the immunity neutralizing principles passively injected into the blood to pass into the cerebrospinal fluid. From their experiments they conclude that as the immunity principles appear in the blood only after several days and the reported favorable effects of the immune serum treatment relate to the first days of illness, the employment of normal serum is not indicated, while that of an immune serum is indicated. From his clinical experience with *normal and immune serum* Zingher (*Jour. Amer. Med. Assoc.*, March 17, 1917, lxviii, No. 11, p. 817) is inclined to believe that the action of serum is beneficial, the intraspinal injection of immune serum being preferable to normal serum, but that the latter is indicated in the acute stages, especially in the preparalytic period of poliomyelitis. In reporting the results of treatment of this disease with immune serum in patients under the care of several physicians, Draper (*Jour. Amer. Med. Assoc.*, April 1, 1917, lxviii, No. 16, p. 1153), while not willing to draw absolute conclusions states that all the men working in their special field last summer came to feel that the serum possessed definite and often striking power to prevent paralysis. The impression was also gained that the serum was of benefit in those cases in which it

Digitized by Google

was given within thirty hours from the time of appearance of signs of meningeal invasion. Peabody (*Bost. Med. and Surg. Jour.*, May 3, 1917, clxxvi, No. 18, p. 636) reports for the Harvard Infantile Paralysis Commission for 1916 that of 54 preparalytic cases treated with immune serum 69 per cent. recovered without paralysis, 21 per cent. recovered with paralysis, and 10 per cent. died. Amoss and Chesney (*Jour. Exper. Med.*, April, 1917, xxv, No. 4, p. 581) employed intraspinal injections of immune serum in fourteen cases, ten (71 per cent.) recovering without detectable paralysis and two (14 per cent.) developed weakness or partial paralysis, and two (14 per cent.) died. That adrenalin chloride and immune serum, either alone or in combination, is the most efficient treatment which has been evolved during this epidemic is the opinion of LeBoutillier (*Amer. Jour. Med. Sc.*, February, 1917, cliii, No. 2, p. 188). After employing various sera and methods of treatment (immune serum, normal serum, own spinal fluid, simple withdrawal of spinal fluid, and no specific treatment at all) in 120 cases, Ulrich (*Bost. Med. and Surg. Jour.*, July 19, 1917, clxxvii, No. 3, p. 78) concludes that not only are the methods he employed useless, but that the necessary procedures are painful and would seem to be permanently harmful, in view of the great need of rest during the early stages of the disease.

The exponents of the streptococcus theory of causation of the disease have made numerous efforts to produce an antipoliomyelitis horse serum. Rosenow (*Jour. Amer. Med. Assoc.*, July 28, 1917, lxix, No. 4, p. 261) reports that the serum of the horse immunized with recently isolated strains from experimental poliomyelitis in the monkey appears to have developed neutralizing, protective, and curative power against the virus of poliomyelitis. Employing this immune horse serum intravenously, Rosenow (*Jour. Amer. Med. Assoc.*, September 29, 1917, lxix, No. 13, p. 1074) states that in the thirty-eight patients in whom there was sufficient time for the serum to act, three died, a mortality of 8 per cent. All of the sixteen cases treated before paralysis had begun recovered without paralysis. Nuzum and Willy (*Jour. Amer. Med. Assoc.*, October 13, 1917, lxix, No. 15, p. 1247) employed antipoliomyelitic horse serum both intraspinally and intravenously in 159 cases of poliomyelitis with a general mortality of 11.9 per cent. In the ten undoubted cases in which the serum was administered prior to the development of paralysis, prevention of paralysis and complete recovery resulted in 100 per cent.

Digitized by Google

EPIDEMIC MENINGITIS

The dangers attending the occurrence of epidemic meningitis among large bodies of troops add special interest to the various investigations carried out during the past year with the object of determining the manner of dissemination, means of diagnosis, and method of treatment of this disease. Outbreaks have occurred among the English and Canadian troops, and, in view of the fact that it has occurred among the armed forces in this country, it is to be hoped that the officials responsible for the health of the troops will see that the camps are equipped to conduct such investigations and adopt such plans as may prevent the development of serious epidemics. The most important factor in the spread of this disease appears to be the healthy carriers, and the appearance of a single case of epidemic meningitis should be the signal for a careful search for possible carriers among the men with whom the patient has been in contact. Flexner (*Jour. Amer. Med. Assoc.,* August 25, September 1, and September 18, 1917, lxix, Nos. 8, 9, and 10, pp. 639, 721, and 817), in an extremely comprehensive and exhaustive article on the mode of infection, means of prevention, and specific treatment of epidemic meningitis, calls attention to the fact that the disease is apparently dependent upon the human host for its transmission, and that, while chronic carriers are the most important factor in the transmission of the disease, temporary carriers may develop from contact with these chronic carriers. He also states that the meningococcus enters and leaves the body by way of the secretions of the nasopharyngeal membranes: the bacteriologic control of the disease, therefore, centres in those membranes. The method for the detection of carriers is described in detail, with the means to be employed for the examination of the suspects, method of identifying the organisms, frequency of occurrence, and treatment of the carriers. He believes that the results from the employment of dichloramine-T in oil after the method devised by Dunham and Dakin (*Brit. Med. Jour.,* 1917, i, 682) are promising, although only a small number of tests have been made upon the carriers of meningococci. In the disinfection of carriers Gordon and Flack (*Brit. Med. Jour.,* November 18, 1916, ii, 2916) report very good results in cases in which only a few colonies have been found, from the direct application of a one per cent. solution of chloramine (sodium paratoluene sulphochloramide) or

Digitized by Google

by subjecting them to inhalation of a steam spray charged with zinc sulphate. The individuals whose nasopharyngeal secretion yielded a copious growth, or a practically pure culture of the meningococcus, were often difficult to cure, the results from zinc salts being disappointing, but those from the use of chloramine were comparatively good. Raffaelli (*Gaz. degli Osped. e delle Clin.*, June 7, 1917, xxxviii, No. 45, p. 665), from the results of blood examination in twenty-two cases, declares that epidemic meningitis is a meningococcus sepsis, with the meninges merely the most common seat of the metastases. He urges that during epidemics the blood, rather than the nasopharyngeal secretions, should be examined, which would disclose carriers much more reliably than by the usual methods. Pizzini (*Policlinico,* May, 1917, xxiv, Med. Sect., No. 5, p. 212) also reports the finding of the organism in the blood in cases in which the nasopharyngeal secretions were free of meningococci, and believes that lice play a part in the epidemiology of the disease. A medium for the cultivation of the meningococcus is described by Gordon, Hine, and Flack (*Brit. Med. Jour.*, November 18, 1916, ii, 2916), and simplifications of the method of agglutination of the meningococcus are proposed by Krumweide (*Jour. Amer. Med. Assoc.*, August 4, 1917, lxix, No. 5, p. 358) and Tunnicliff (*Jour. Amer. Med. Assoc.*, September 8, 1917, lxix, No. 10, p. 786).

The literature contains numerous reports (Worster-Drought, *Brit. Med. Jour.*, November 18, 1916, ii, No. 2916, p. 689; Robb, *Brit. Med. Jour.*, April 14, 1917, i, No. 2937, p. 478; Randone, *Pediatra,* May, 1917, No. 5; Gavelli, *Policlinico,* October 29, 1916, xxiii, No. 44, p. 1276; Götz and Hanfland, *Deut. med. Woch.*, October 19, 1916, xlii, No. 42, p. 1284) testifying to the efficacy of the *antimeningococcus serum* in the treatment of this disease, practically all of them laying stress upon the importance of instituting this treatment early in the disease. In the article referred to above, Flexner describes in detail the method for administering the serum, the results obtained by its use, and emphasizes the importance of employing polyvalent serum. Belliboni (*Gaz. degli Osped. e delle Clin.*, February 18, 1917, xxxviii, No. 14, p. 211) and Hekman (*Nederl. Tijd. voor Gen.*, May 5, 1917, i, No. 18, p. 1448) have employed the serum intramuscularly instead of intraspinally with beneficial results. That the results of serum treatment are not universally favorable may be

Digitized by Google

judged from the reports of Mühsam (*Berl. klin. Woch.,* November 27, 1916, liii, No. 48, p. 1293), who states that the mortality among the numerous cases in which it was employed was 56 per cent., whereas among a very large number of cases in which he merely performed daily lumbar punctures with the withdrawal of large amounts of fluid (up to 100 Cc. at a time) the mortality was only 5 per cent., and he never witnessed any serious mishaps from the treatment.

TYPHOID FEVER

The large number of epidemics which have been studied intensively have clearly demonstrated the dangers of contaminated water and milk in the spread of this disease. Occasionally our attention is called to the possibility of ice cream, oysters, and other articles of diet acting as a medium for the transmission of the disease. That the green vegetables may possibly act as carriers of the *Bacillus typhosus* has been demonstrated by Melick (*Jour. Infect. Dis.,* July 1, 1917, p. 28). His experiments show that typhoid bacilli may retain their viability in garden soils of various kinds for periods of three to seven weeks. Soil contaminated with typhoid excreta may, therefore, possibly infect radishes, lettuce, celery, and any other of the vegetables which are usually eaten without previously heating.

The literature on the subject of typhoid fever consists almost exclusively of articles on prophylactic and therapeutic vaccination, only occasionally a clinical paper being encountered. Coleman (*Jour. Amer. Med. Assoc.,* August 4, 1917, lxix, No. 5, p. 329) reports on his experience with the high caloric diet as employed in 222 cases, comparing the results with those obtained in 222 cases on a milk diet. While the temperature is apparently not affected by the high caloric diet, the total duration of the disease is materially shortened through the shortening of convalescence. Certain symptoms which hitherto have been attributed to the specific action of the typhoid bacillus he believes have been shown to be due to faulty methods of treatment, in particular to an inadequate or improperly balanced diet. Complications were less formidable, or perhaps less frequent, by maintaining the patient in the best possible state of nutrition. He states that the mortality from the disease is reduced by 50 to 75 per cent.

Now that the value of *vaccination against typhoid and paratyphoid* has been firmly established, the interest in this preventive measure is

Digitized by Google

chiefly centred in the method of inoculation. A comparison between the United States Army method and the Gay-Claypole method of vaccination has been made by Kilgore (*Arch. Int. Med.*, February, 1917, xix, No. 2) in a limited number of cases. From his experiences he draws the following conclusions: (1) The higher the typhoidin quotient in a given person, the greater the chances of a severe reaction to antityphoid inoculation. (2) The severer local reactions to vaccine tend to occur in those subjects with the higher temperature reactions. (3) The supposedly more severe average reaction to antityphoid inoculation of subjects who have previously had the treatment is probably overrated. (4) The use of army vaccine, or sensitized vaccine, sediment, if the preparations are fresh, makes little, if any, difference in the average local and temperature reactions. (5) When either type of vaccine is administered every other day, the temperature reactions following the second and third doses are likely to be more severe than when the injections are ten days apart. A difference in the local reactions is not so clear cut. The average impression of the subjects vaccinated every other day is that the second injection gave the greatest local and general discomfort and the third the least. The average member of the ten-day group feels that both general and local reactions were less with each succeeding dose. (6) The typhoidin test failed to show any noteworthy differences in effectiveness between the two-day or ten-day schedules, and, in the first few weeks, between the two vaccines used. Later the typhoidin quotients were higher in those who had received sensitized vaccine, but the differences are not decided enough to support definite conclusions that this is the rule. (7) According to the typhoidin test, it is suggested that the ones who react least to vaccination tend to profit most by its administration.

With the idea of simplifying the technic of vaccination, Widal and Salimbeni (*Presse Méd.*, January 4, 1917, xxv, No. 1, p. 1) have employed a vaccine of typhoid and A and B paratyphoid organisms in a concentrated solution, employing a single inoculation. In the 5000 persons on whom this concentrated vaccine has been employed the reactions were no more severe than with weaker vaccines, while the antibodies were found later in the blood as abundant as in those given the usual doses. In a later article (*Presse Méd.*, August 16, 1917, xxv, No. 46, p. 473) they report having a record of 12,000 men

Digitized by Google

inoculated with a single dose (15 Cc.) of this concentrated triple vaccine, containing six thousand million organisms. The method has been employed for too short a period to judge of its efficacy, and they counsel for the present employing the usual double method as being safer. When an emergency arises in which it would be impossible to give the second dose this method might be employed. Vastellani and Taylor (*Brit. Med. Jour.*, September 15, 1917, ii, No. 2959, p. 356) suggest combining with typhoid and paratyphoid organism of A and B types other organisms, such as *V. choleræ, M. melitensis,* and *B. pestis.* They claim that the inoculation of the combined vaccines is harmless, the reaction not being any more severe than when *B. pestis* is given alone; and when that organism was omitted the reactions were not severe. They claim that the main advantage is the saving of time, protection being secured in a little over one week instead of two months, which is the time it would require to give the organisms singly. Loeper (*Presse Méd.*, October 19, 1916, xxiv, No. 58, p. 463) reports the development of a certain group of phenomena following typhoid vaccination which he believes is due to a special affinity of the vaccine for the suprarenals. He warns that the injections should never be given to fatigued men, and epinephrin should be given a few hours before vaccination if the blood-pressure is low and again a few hours later if the pressure keeps low or drops lower. Stefansky (*Russky Vratch,* xvi, No. 3, p. 59) and Lintz (*Jour. Amer. Med. Assoc.*, May 5, 1917, lxviii, No. 18, p. 1319) report serious phenomena as the result of inoculation which they believe to be the result of anaphylaxis.

The study of the blood in typhoid fever occurring in the vaccinated continues to attract considerable attention. The increase in agglutination titer during the course of an infection has been fairly generously accepted as indicating the presence of typhoid fever. Conradi and Bieling (*Deut. med. Woch.*, October 19, 1916, xlii, No. 42, p. 1280) believe that this phenomenon can not be accepted in the differentiation of typhoid in those who have been vaccinated against this disease or who have previously had typhoid, as they have encountered it in cases in which autopsy has shown it to be some other condition. Baglioni (*Gaz. degli Osped. e delle Clin.*, February 4, 1917, xxxviii, No. 10, p. 146) also believes that not much reliance can be placed on the sero-reactions in the vaccinated. He also states

Digitized by Google

that the immunity conferred by antityphoid vaccination varies in individual cases, just as one attack of typhoid may or may not protect against another attack. Demolon (*Paris Méd.*; October 21, 1916, vi, No. 43, p. 354) states that typhoid bacilli linger only a very short time in the blood of a vaccinated subject. If a polyvalent vaccine has been used, he states there is liable to be coagglutination of the three strains, but the one involved is agglutinated more intensely and more rapidly than the others. Persistence of agglutination in the serum of a patient who has had a temperature of 102° F. for four days, whether estimated by macroscopic or microscopic method, Wilson (*Lancet,* London, February 17, 1917, i, No. 4877, p. 263) believes, is sufficient to justify a diagnosis of typhoid.

That previous vaccination not only modifies the clinical course and symptoms of typhoid fever but appears to cause a milder and shorter course of the disease and to lower the death-rate is the opinion of Lehndorff (*Med. Klin.,* October 22, 1916, xii, No. 43, p. 1117) and Guizzetti (*Riforma Medica,* March 31, 1917, xxxiii, No. 13, p. 338), but it does not serve to ward off or mitigate complications, the latter even recording a higher proportion of deaths from peritonitis resulting from perforation among the vaccinated than the non-vaccinated (44 and 12.5 per cent. respectively).

The treatment of typhoid fever with vaccines has shown no striking development during the past year. Most of the reports are based upon too small a number of cases to be of special significance. Caronia (*Pediatria,* January, 1917, xxv, No. 1) states that his experience with a vaccine similar to that of Di Cristina's (sensitized, polyvalent) has been distinctly favorable, being equally effective when administered by the intramuscular or intravenous route. Gay (*Jour. Lab. and Clin. Med.,* August, 1917, ii, No. 11) reports that in 98 cases of typhoid the employment of sensitized typhoid vaccine sediment resulted in a mortality of 6.6 per cent., with a few complications. Relapses were distinctly reduced in those cases in which the intravenous injections were followed by a series of three subcutaneous inoculations after the temperature had reached normal. Pensuti (*Policlinico,* February, 1917, Med. Sect., No. 2, p. 83) believes that better results were obtained by the administration of small daily doses of vaccine; some of the cases which he cites seem to support the assumption that the vaccine has some chemical action neutralizing the toxins.

Digitized by Google

The carrier problem is one which is becoming more and more important from the standpoint of prevention. Many of the epidemics of this disease are being traced to these chronic carriers of the *B. typhosus*. Cumming (*Jour. Amer. Med. Assoc.*, August 21, 1917, lxviii, No. 16, p. 1163) reports an epidemic resulting from the contamination of ice cream by a typhoid carrier. It is unfortunate that so far our measures for the detection of carriers are dependent upon the development of the disease, and that these carriers can not be recognized before they have spread the disease. The routine examination of typhoid convalescents for the presence of the organisms, with quarantine regulations insisted upon until the possibility of the patient developing into a carrier has been eliminated, would seem to be the only possible solution of the problem. The prevalence of carriers may be estimated from the report of Chesley, Burns, Greene, and Wade (*Jour. Amer. Med. Assoc.*, June 23, 1917, lxviii, No. 25, p. 1882) on three years' experience in the search for typhoid carriers in Minnesota, during which time sixty-nine carriers of *B. typhosus* or *B. paratyphosus* have been identified by the laboratory. The detection of carriers is not an easy matter, and it is to be hoped that a simplification of the technic for the isolation of the organisms may be developed. Nedrigailoff (*Russky Vratch*, xvi, No. 4, p. 83) believes that the method of mixing benzene with the stools is of material assistance in the search for *B. typhosus*, by its action in preventing the growth of other organisms which may be present. The typhoidin skin reaction and Widal test as employed at present seem to be valueless in the recognition of carriers. The treatment of carriers is also far from satisfactory, although Goubau (*Arch. Med.*, Belges, July, 1917, lxx, No. 7, p. 590) reports the disappearance in two months of bacilli from the discharge of twenty-three carriers treated during the first five months after disease by means of autovaccine or Wright's monovalent vaccine in weekly injections. Herz (*Wien. klin. Woch.*, October 11, 1916, xxix, No. 41, p. 1290), in four carriers in which he employed this method, has found the urine and fæces negative for *B. typhosus* as the result of four or five injections into the gluteal muscle of 10 Cc. of milk boiled in the water-bath. The reaction to the protein was comparatively insignificant, the disturbances being fewer, as a rule, than those from antityphoid vaccination.

Digitized by Google

A very high proportion (4 per cent.) of carriers in a regiment returning from the Mexican border where the men had been exposed to paratyphoid infection is reported by Krumwiede (*Jour. Inf. Dis.*, 1917, xxi, 141). In the bacteriologic examination of the excreta he obtained very good results from the use of brilliant green agar plates, the Endo plates giving only 52 per cent. of the total positives obtained upon the dye-agar.

TYPHUS FEVER

The investigations of Plotz, Baer, Olitsky, Denzer, and Husk in regard to the causation of this disease have been carried on in Mexico, the Balkans, and Russia, their results apparently confirming the work of Plotz in New York in identifying the *B. typhiexanthematici* as the etiologic factor (*Jour. Infect. Dis.*, 1916, 19, 811, and 1917, 20, 201). That the organism is transmitted by lice seems to be very probable from the work of Olitsky, Denzer, and Husk (*Jour. Am. Med. Assoc.*, April 21, 1917, lxviii, No. 16, p. 1165), as they have been able to demonstrate its presence in lice from typhus cases only. Their work seems to be confirmed by their finding antibodies against *B. typhiexanthematici*, demonstrated by the Dale method, in the serum of typhus fever patients after the crisis (Denzer and Olitsky, *Jour. Infect. Dis.*, 1917, xx, 99). There is still considerable question whether the organism described by Plotz and that described by Ricketts and Wilder, Prowazek, and others are identical. That they are different organisms and that the Plotz organism is not responsible for typhus is the opinion of da Rochalima (*Münch. med. Woch.*, September 26, 1916, lxiii, No. 39, p. 1381), and he prefers the name *Rickettsia prowazeki* (*Deut. med. Woch.*, November 2, 1916, xlii, No. 44, p. 1353). His investigations have demonstrated that the organism he describes can be found in the body of lice which have been in contact with typhus fever patients, where they set up characteristic changes. That the serum of typhus fever patients will produce agglutination in a certain strain of proteus bacilli (Weil-Felix reaction) has been confirmed by the reports of Cancik (*Wien klin. Woch.*, December 7, 1916, xxix, No. 49, p. 1552), Dietrich (*Deut. med. Woch.*, December 21, 1916, xlii, No. 51), and Otto (*Med. Klin.*, October 29, 1916, xii, No. 44, p. 1143).

Digitized by Google

LOBAR PNEUMONIA

The importance of any disease is directly proportionate to its death-rate. For many years tuberculosis has maintained the unenviable record of being the disease which caused the greatest number of deaths. The decline in the death-rate from tuberculosis has forced pneumonia into first place, with no immediate prospect of its position being disputed. It is to be hoped that, with a better knowledge of the cause of the disease and its methods of dissemination, a well-organized, general campaign of prevention will be productive of results. A valuable contribution to our knowledge of the epidemiology of pneumonia has recently been made by Stillman (*Jour. Exper. Med.*, December, 1916, xxiv, No. 6, p. 651), who has studied the types of organisms found in cases of lobar pneumonia during the past four years. He has found that the majority of cases are due to organisms of Type I and Type II. The organism usually found in the mouths of healthy individuals is Type IV, fairly frequently Type III is present, and occasionally atypical forms of Type II. The question of transmission of the disease seems mainly to be one of "carriers," and it is interesting to note that he has found Types I and II in the mouths of healthy individuals who have been in contact with patients suffering from those types of pneumonia and also in the mouths of convalescents for varying periods of time following recovery from the disease. Occasionally a carrier of Type I and Type II pneumococcus was encountered in which it was impossible to trace any contact with an infected patient. Further studies along this same line may eventually provide such data as will warrant the establishment of a plan for the detection and treatment under quarantine for such carriers similar to that being attempted in regard to typhoid fever. An essential requirement in the intelligent treatment, prognosis, and prevention of any cause of lobar pneumonia is the ready determination of the type of pneumococcus with which one is dealing in the individual case. Any improvement in the method of group determination of the organisms is of interest. Blake (*Jour. Exper. Med.*, July, 1917, xxvi, No. 1, p. 67) has devised a method, based upon the presence of a soluble substance found in the peritoneal exudate of the inoculated mice giving a precipitin reaction with homologous immune serum, which he believes obviates some of the difficulties encountered in the older cultural methods employed.

Digitized by Google

Prophylactic inoculation as a method of prevention has proved of such enormous value in other diseases that it is natural an attempt would be made along this same line to provide protection against pneumonia. The investigations of Lister (Publication of the South African Institute for Medical Research, Johannesburg, 1916, 8) with vaccines against definite types of pneumococci would indicate that a certain amount of protection is afforded against the types of organisms employed, as estimated by the serum reactions. There is some doubt as to whether there is sufficient immunity developed in man by the inoculations to have any real protective value. The results obtained by Lister are sufficiently promising to warrant further study along the same line.

The reports of treatment with specific sera, prepared from organisms of the different types, are becoming sufficient in number to warrant conclusions being drawn as to their value. Cole (*Jour. Amer. Med. Assoc.*, August 18, 1917, lxix, No. 7, p. 505) reports that the serum they have employed in Type II cases has not so far been shown to influence the course of the disease. The serum treatment of the cases due to Type I infection he believes is of distinct value, by its use the mortality being materially reduced, in the 105 cases treated the death-rate being about 7.5 per cent., instead of 25 to 30 per cent., as in the untreated cases in this group. He states that in order to obtain the best results certain precautions must be taken and the serum administered according to a definite plan. In the first place, every patient to be treated must be tested with 0.5 to 1 Cc. horse serum injected into the skin to determine whether the patient is sensitized to horse serum. "If the patient is sensitive to horse serum, a reaction appears about the site of injection in an hour or two, and by the time the type of infecting organism has been determined (twenty-four to forty-eight hours), the patient is largely desensitized. Then, when the serum is injected, it is introduced very slowly, fifteen minutes being allowed for the injection of the first 15 Cc. If no reaction has occurred (tachycardia, restlessness, suffusion of face, dyspnœa, or urticaria), the remainder may be given rapidly. If the skin test has shown the patient to be sensitive, additional measures must be taken to desensitize the patient. This is accomplished by beginning with small doses of the serum, repeated often, and gradually increasing the size of the dose. Care should also

Digitized by Google

be taken with patients who are known to suffer from asthma, hay fever, or other forms of protein sensitiveness. The second group of reactions are those similar to the first group. These are non-specific protein intoxications and will occur occasionally. Some lots of serum are more liable to produce them, and these sera should not be used. If an attack supervenes, 0.5 Cc. epinephrin or 0.01 grain of atropine usually gives relief. The last group of reactions are those occurring usually from seven to fourteen days following the injections of serum, and are the reactions grouped under the term "serum sickness," consisting of fever, skin rashes, glandular enlargements, œdema of skin, and joint pains. Mild symptoms occur in about half the cases treated; severe ones rarely. They are distressing, but are always recovered from without sequelæ. The urticaria is most distressing, and is temporarily relieved by injections of epinephrin, and the itching by phenol washes.

"The treatment requires the determination of the type of infecting organisms, as polyvalent sera should not be used, because the serum reactions should not be risked unless it is known that the serum is potent for the particular type of pneumococcus involved. The method of determining the type of infecting organism is complicated, but not greatly so, and may be carried out in any place where cultures may be examined for the diphtheria bacillus. The treatment should be begun as soon as the case has been proved to be due to Type I pneumococci, as any delays are unjustifiable. The serum should be known to be of proper strength and potency, and should not be used unless guaranteed to be so by a reliable manufacturer. The serum should be administered intravenously, preferably diluted once with freshly prepared sterile salt solution. The patient should receive in the first dose 75 to 100 Cc. of the serum, and, if necessary, it should be repeated every six or eight hours until a favorable result is obtained. The average dose used in the author's cases last winter was 250 Cc. Usually within an hour or two after the injection there is a slight rise of temperature, followed by a marked fall. Frequently, after eight or more hours, the temperature begins to rise again; the cases should be carefully watched, the temperature taken every two hours, and as soon as this rise appears the dose of serum is repeated. If no change occurs following the first administration, the second injection should be given at the end of six or eight hours. Clinical and ex-

Digitized by Google

perimental evidence indicates that the treatment should be persevered in, even though no reaction is obtained after several doses."

Cole also states that so far 500 cases of pneumonia have been studied from the standpoint of the type of organism with which they are infected. About one-third are due to pneumococci of Type I, one-third to Type II, 10 to 15 per cent. to Type III, and the remainder are due to infection with pneumococci of Type IV. The mortality varies greatly with the type of organism; in Type I and Type II the mortality being from 25 to 30 per cent., in Type III about 50 per cent., while in cases with Group IV infection the mortality is usually not more than 10 to 15 per cent. The method of producing the Type I antipneumococcic serum is described by Cole and Moore (*Jour. Exper. Med.*, October, 1917, xxvi, No. 4, p. 537), their observations so far indicating the importance of employing small doses of culture frequently repeated. Wadsworth and Kirkbride (*Jour. Exper. Med.*, May, 1917, xxv, No. 5, p. 629) report that the serum obtained by the immunizing of a horse with Type III organisms possessed a slight degree of protection for mice against the corresponding organisms. The serum proved of distinct value as a diagnostic aid in the differentiation of pneumococcus strains.

Ethylhydrocuprein, or *optochin*, as it is known commercially, is believed by Chesney (*New York Med. Jour.*, 1917, cv, 234) to possess a curative action in pneumonia. Moore and Chesney (*Arch. Int. Med.*, 1917, xix, p. 611), from their experience with a series of thirty-two cases, believe that when ethylhydrocuprein hydrochloride is given by mouth to patients suffering from acute lobar pneumonia in such amounts they receive at least 0.024 Gm. per kilogramme of body weight for twenty-four hours, and when the size and spacing of the individual doses are adequately regulated a specific pneumococcidal action appears in their blood within a few hours, which can be maintained more or less constant for several days. The administration of the drug is accompanied not infrequently by toxic symptoms, such as tinnitus, deafness, amblyopia, or amaurosis, and, while these may be transient, retinitis may result in more or less permanent impairment of vision or even blindness. Cohen, Kolmer, Heist, and Steinfeld (*Jour. Infect. Dis.*, March, 1917, xx, pp. 272, 313, 333) have conducted a series of experiments with ethylhydrocuprein, which tend to show that, while it possesses

Digitized by Google

a real protective and curative value in experimental pneumococcus infections, its antipneumococcus potency is somewhat less than previously reported. They believe its curative effect is to be ascribed to its influence on phagocytosis.

An exhaustive review of the treatment of pneumonia during the last century or two is contributed by Neubürger (*Med. Klin.*, November 5, 1916, xii, No. 45, p. 1195), who lays special emphasis upon leaving the case to nature, avoiding medication as much as possible. For the relief of the severe delirium occasionally accompanying pneumonia, Musser and Hufford (*Jour. Amer. Med. Assoc.*, April 28, 1917, lxviii, No. 17, p. 1231) recommend lumbar puncture. An exhaustive study of pulmonary œdema in pneumonia and an outline of its treatment are contributed by Bastedo (*Jour. Amer. Med. Assoc.*, September 8, 1917, lxix, No. 10, p. 800), who believes the most reliable procedures for its relief are: Strophanthin intravenously, caffeine subcutaneously, oxygen inhalations, venesection, and perhaps counter-irritation to the chest. Supplementary treatment should be determined by the presence of acidosis or other associated conditions.

PULMONARY TUBERCULOSIS

Chemotherapy.—It is impossible to estimate the effect upon the public health and welfare of an agent which would be as effectual in the treatment of this disease as salvarsan and similar preparations are in the treatment of syphilis.

For a number of years Lewis, of the Phipps Institute in Philadelphia, has been conducting a series of experiments with various chemical agents, testing them with special reference to their effect upon the tubercle bacilli and their ability to concentrate in diseased tissue (*Bull. of Johns Hopkins Hosp.*, March, 1917, xxviii, No. 313). In a general survey of the question of chemotherapy in tuberculosis (*Amer. Jour. Med. Sc.*, May, 1917, cliii, No. 5, p. 625) he states: "The accomplishments of our laboratory up to the present in the endeavor to study tuberculosis from the chemotherapeutic point of view can then be summarized in a sentence: We have built up several substances which in the test-tube are capable of restraining the growth of the tubercle bacillus in marked and measurably specific degree, and which, when injected into the living tuberculous animal,

Digitized by Google

are capable of penetrating to the centre of the masses of diseased tissue."

His statement, "Each year of the five that I have been actively engaged in this work has seen some added idea or suggestion of real value, and we may be sure that if in the future faith is expressed in continuous experimentation and confidence is put in evidence by financial support adequate to the size of the task in hand the desired result will be achieved," is exceedingly encouraging to any one interested in this disease, coming as it does from a worker with such a wide experience and conservative judgment.

The principle of chemotherapy, in the sense of a special affinity of the bacilli or of the diseased tissues for the introduced drug, has not been proved, in the opinion of Stern (*Zeit. für Tuberk.*, 1916, xxvi, No. 4, p. 244). Otani (*New York Med. Jour.*, 1917, cv, 537) has employed cyanocuprol in 118 cases, and says that it has been shown to be effective in cases of varying degrees of severity.

Complement Fixation.—Numerous investigations have been carried out with the hope of determining some method of examining the serum which would not only indicate the presence of tuberculous infection in an individual but which might be employed as giving an index of the activity of the process. Corper and Sweany (*Jour. Amer. Med. Assoc.*, June 2, 1917, lxviii, No. 22, p. 1598) compared the autolysate and Miller's bacillary antigen in 327 serums and report there is not a great deal of difference between them. They believe it is impossible by means of this test absolutely to differentiate active from inactive tuberculosis, the former giving a slightly higher number of positive reactions than the latter. They state that a positive complement-fixation test for tuberculosis in the absence of a positive Wassermann reaction is mainly of differential diagnostic value, and, taken with other findings, aids in making a definite diagnosis of tuberculosis. Woods, Bushnell, and Maddux (*Jour. Immun.*, April 11, 1917, No. 3, p. 301), employing the partial antigens of Deyke and Much, found negative results in the seventy-two serums from normal cases and 91 per cent. of the clinically inactive tuberculosis cases. Ninety per cent. of the incipient tuberculous cases, 87 per cent. of the clinically active tuberculous cases, and 92 per cent. of the serums from advanced tuberculous cases reacted positively. Burns, Slack, Castleman, and Bailey (*Jour. Amer. Med. Assoc.*,

Digitized by Google

May 12, 1917, lxviii, No. 19, p. 1386) believe the test is specific for tuberculosis, although they admit that perhaps their number of tests from nontuberculous cases was too few for a definite statement to that effect. It is their opinion that the test will prove of great value as an aid to diagnosis in cases showing suggestive physical signs, but in which it is impossible to demonstrate the presence of tubercle bacilli in the sputum. It is the opinion of McCaskey (*Amer. Jour. Med. Sc.,* November, 1917, cliv, No. 5, p. 648) that complement binding antibodies are or may be present in blood of both clinically active and inactive cases; that they may be intermittently absent in both groups of cases, but are more constantly present in active than in inactive cases; and that the fact of their presence as revealed by this test is valuable information which decides nothing but the existence of a focus which is at least pathologically active.

Artificial Pneumothorax.—The results obtained by this method of treatment are always of interest, as they tend to more sharply define the indications and contra-indications, and establish figures upon which one may form an opinion as to how much one may expect from this procedure. Thirty cases have been treated by this method by Ringer (*Amer. Jour. Med. Sc.,* September, 1917, cliv, No. 3, p. 380), who groups his results as follows: (1) Complete success, seven cases, or 23.3 per cent. (2) Complete success for stopping hemorrhage, three cases, or 10 per cent. (3) Partial success (gas still being given), two cases, or 6.6 per cent. (4) Prolongation of life for an appreciable period of time, four cases, or 13.3 per cent. (5) Failure, fourteen cases, or 46.6 per cent. If headings (1) and (2) are combined, the percentage of successful attempts is raised to 33.3 per cent. He ascribes failure in the fourteen cases to the following causes: (1) Pocket formation with a small amount of gas injected, but surrounding adhesions so dense as to preclude any appreciable amount of collapse, five cases. (2) Adhesions so dense as to obliterate pleural space, five cases. (3) Compression obtained to a decided degree, but no result apparent, probably because of deep-seated undiscoverable or undiscovered disease in opposite side, two cases. (4) Tuberculous pneumonia developing in opposite side, one case. (5) Exhaustion: Lung collapsed, but patient too near death to rally, one case. He considers the method worth while, its great impediment to success being adhesions in the pleural space. Koefoed

Digitized by Google

(*Ugesk. for Laeger,* November 2, 1916, lxxviii, No. 44, p. 1931) gives the details of thirty-three cases in which artificial pneumothorax was induced in the treatment of unilateral pulmonary tuberculosis. All have been dismissed from treatment for six months at least, the majority for from one to five years. They all belong to the working class, and are dependent upon their own labor for support. He states that their earning capacity is little, if at all, impaired. Of the 200 sanatorium cases in which he attempted artificial pneumothorax, it could be completed in only 110 cases. In this group 31.3 per cent. have full earning capacity. In 37.4 per cent. the progress of the disease was not arrested and the patients have since died. In the ninety cases in which it was impossible to induce pneumothorax, 57.9 per cent. have died and only 14.4 per cent. are self-supporting.

Beggs (*Amer. Rev. of Tuber.,* November, 1917, vol. i, No. 9, p. 509) presents a strong plea for more frequent employment of this method of treatment, at an earlier stage in the disease than is now the usual custom. He states that "In justice to the patient it should be considered in every case of advanced or moderately advanced, slowly progressive pulmonary tuberculosis, and in every case of actively progressive pulmonary tuberculosis in any stage, because the normal trend of all these is toward death." He believes that it restores to practical health many otherwise hopeless cases, and prolongs the lives and increases the comfort of many others. He considers it a positive influence in decreasing the period of incapacity.

A review of his experience with artificial pneumothorax over a period of four and one-half years is contributed by Minor (*Amer. Rev. of Tuber.,* November, 1917, vol. i, No. 9, p. 522), who believes he has had very encouraging results from its use. In his opinion the method is chiefly applicable to moderately advanced, or advanced, chronic cases, with or without exacerbations, but not to florid, acute cases or to incipient ones, unless these show an acute waking up. It may at times be useful in cases of abscess of the lung and hemorrhage; if we can be sure of the lung from which the blood comes, it is one of the most valuable measures, granted no adhesions exist.

BRONCHIAL ASTHMA

During the past year numerous studies have been made with the object of determining the relation between bronchial asthma and

Digitized by Google

sensitization to various proteins. It appears that in a certain proportion of the asthmatics the relation between certain foreign proteins and the asthmatic seizures can be clearly demonstrated, the therapeutic measures adopted being followed by very decided improvement or cure. There still remain a certain number of cases of bronchial asthma in which it is impossible to demonstrate any protein sensitization by our present methods of determination, which cases must be treated by the older methods for the present. These non-sensitive cases, according to Walker (*Jour. Amer. Med. Assoc.*, August 4, 1917, lxix, No. 5, p. 363) constitute about 45 per cent. of the cases met with, the attacks usually come on after the fortieth year of age, and cardiorenal disease is a relatively frequent complication. It is possible that with improvement in the methods of determining the presence of protein sensitization this group of non-sensitives will be further diminished.

Spasmodic attacks of dyspnœa, apparently identical with the bronchial asthmatic seizures, have been proved to occur as anaphylactic phenomena in experimental animals. The respiratory seizures resulting from intranasal instillation of horse serum in sensitized guinea-pigs have been carefully studied by Sewall (*Jour. Lab. and Clin. Med.*, September, 1917, ii, No. 12, p. 874). The essential nature of the reaction is still somewhat obscure, although Manwaring and Kusama (*Jour. of Immun.*, February 11, 1917, No. 2) have attempted to analyze the reaction by means of perfusion experiments with isolated guinea-pig lungs. The problem of determining the protein responsible in the individual case is further complicated by the fact that a certain number of asthmatics have been shown to be sensitized to several proteins, either belonging to the same or different groups. As the treatment of these cases depends upon the ability to desensitize the patient to the offending protein, it is of primary importance that the protein responsible for the anaphylactic phenomena be accurately determined in the individual case.

The foreign proteins which may be responsible for the seizures may be derived from food products (as wheat, eggs, fish, shell-fish, beef, etc.), animal emanations (as horses, cats, guinea-pigs, dogs, cattle, etc.), pollens, or bacteria. The determination of the protein to which the patient is sensitive is best carried out by applying the various proteins to the abraded or scarified skin, a raised white

Digitized by Google

elevation or urticarial wheal surrounding the point of application constituting a positive reaction. The abrasion may be made with a von Pirquet scarifier, or small cuts are made with a sharp scalpel on the ulnar surface of the forearm, each cut being about one-eighth of an inch long, penetrating the skin, but not deep enough to draw blood. Some observers prefer making intradermic injections (not hypodermic) with solutions of the suspected proteins, a method which is not so simple as the other, but is claimed to be more accurate. On each cut is placed a protein, and to it is added a drop of tenth-normal sodium hydroxide solution to dissolve the protein and to permit of its rapid absorption. At the end of one-half hour the proteins are washed off and the reactions noted, always comparing them to the control cut, to which no protein has been applied. The number of proteins which may be employed in making the tests is theoretically almost unlimited. For practical purposes, however, it has been shown that the majority of asthmatics (due to sensitization) are due to horse dandruff, *Staphylococcus pyogenes aureus,* wheat, pollens, *Staphylococcus pyogenes albus,* cat hair, and a few common foods, as casein, chicken meat, and egg (Walker, *Jour. Amer. Med. Assoc.,* August 4, 1917, lxix, No. 5, p. 363).

Where bacteria are apparently responsible for the attacks the source of the bacterial protein must be sought in some focus in the body, tooth abscess, tonsils, accessory sinuses of the nose, or possibly in the bronchopulmonary system itself.

Treatment of asthma due to a specific foreign protein consists in desensitization by the cautious hypodermic or intravenous administration of the offending protein, with gradual increase in the amount until the skin reaction becomes negative. When an article of diet is responsible, cautious feeding with small amounts of the special article of diet may be employed, the quantity being gradually increased. When the bacteria responsible for the attacks can be definitely determined, vaccine treatment may prove of value (Babcock, *Jour. Amer. Med. Assoc.,* February 10, 1917, lxviii, No. 6, p. 438). Sicard (*Amer. Jour. Med. Sc.,* June, 1917, cliii, No. 6) is convinced that whatever the variety of germ causing the attacks, whether *Streptococcus viridans* or *Streptococcus hæmolyticus,* an autogenous vaccine made from the sputum will cure the attack.

That the tubercle bacilli toxins may be responsible in some cases

Digitized by Google

is suggested by two cases reported by Frenguelli (*Semana Medica,* Buenos Aires, 1916, xxiii, No. 49) in which the administration of tuberculin was followed by marked improvement and subsequent apparent cure.

The necessity of caution in administering these foreign proteins for therapeutic purposes is well illustrated by the two cases reported by Rackemann (*Jour. Amer. Med. Assoc.,* September 15, 1917, lxix, No. 11), in which very alarming symptoms of typical serum disease developed after the hypodermic injection of the offending protein, in both instances horse-hair proteins. In certain selected cases Auld (*Brit. Med. Jour.,* May 5, 1917, i, No. 2940) claims to have had favorable results from the subcutaneous injection of a water solution of peptone, ⅓ Gm., increased to 1 Gm., in 5 to 10 Cc. of water at blood heat being injected at intervals of three to four days.

TRENCH FEVER

During the past two years numerous cases have been reported in which individuals who have visited training camps or convalescent hospitals, or troops who have been doing trench work, have been attacked by this obscure disease. Cases have even been reported as occurring in training camps in England (Ramsay, *Brit. Med. Jour.,* February 17, 1917, i, No. 2929, p. 222) affecting men who have never been in the trenches and who are not infected with lice, which have been suspected as the agent of transmission. The characteristic features of the disease are the temperature curve, a sudden rise of temperature followed by several days of apyrexia, with a recurrence of the fever; pains in the shins, a leucocytosis of 14,000 to 16,000 in the febrile period, with an increase in the large mononuclear lymphocytes to from 15 to 25 per cent. and a relative decrease in the proportion of polymorphonuclears (Mandel, *Jour. Amer. Med. Assoc.,* September 1, 1917, lxix, No. 9, p. 725). The cause of the condition is still somewhat uncertain, although Dimond (*Lancet,* London, September 8, 1917, ii, No. 4906, p. 382) has reported finding a small hemogregarine in the blood of twelve cases of trench fever. Hurst (*Lancet,* London, October 14, 1916, cxci, No. 4859) states that no treatment has been discovered which will prevent the periodic returns of attacks or which is really effective in overcoming the pain, although some relief may be obtained if constipation is prevented by aperients, and hot applications are used for the pains.

Digitized by Google

INFECTIOUS JAUNDICE

Special interest is attached to this disease owing to its appearance among the troops in Europe, the English forces in France (Dawson, Hume, and Bedson, *Brit. Med. Jour.*, September 15, 1917, ii, No. 2959, p. 345), the Italian army (Civalleri, *Rev. Crit. di clin. Med.*, xviii, July 21 and 28, Nos. 29 and 30, pp. 293 and 301; Moreschi and Carpi, *Policlinico*, October 22, 1916, xxiii, No. 43, p. 1256; entire number of *Policlinico*, February 25, 1917, xxiv, No. 9, is devoted to articles on this subject; and Chiadini, *Policlinico*, November 12, 1916, xxiii, No. 46, p. 1341), in French soldiers (Garnier and Reilly, *Paris Méd.*, March 3, 1917, vii, No. 9, p. 196), and in the German troops (Bäumler, *Münch. med. Woch.*, October 17, 1916, lxiii, No. 42, p. 1477). The *Spirochæta nodosa* or *Spirochæta icterohemorrhagiæ* has been definitely determined as the cause of the disease, and from later experiments it would seem as though the disease was spread by means of rats (Ido, Hoki, Ito, and Wani, *Jour. Exper. Med.*, September, 1917, xxvi, No. 3, p. 341; Cornet, *Paris Méd.*, March 3, 1917, vii, No. 9, p. 193), the microörganisms being found located in the kidneys and excreted in the urine of these animals. Noguchi (*Jour. Exper. Med.*, May, 1917, xxv, No. 5) has found in wild rats in this country a spirochæte apparently identical with the Belgian and Japanese strains. He also points out that the organism does not possess the characteristics of a true spirochæte nor of a spirillum, and he therefore suggests the term Leptospira.

An immune serum has been prepared from the horse by Inada, Ido, Hoki, Ito, and Wani (*Corr.-Blatt für Schw. Aerzte*, January 20, 1917, xlvii, No. 3, p. 65), both experimental and clinical experience with which suggests its efficacy in the treatment of Weil's disease. Martin and Pettit (*Presse Méd.*, December 14, 1916, xxiv, No. 69, p. 569) have also produced an antiserum which seems to be of considerable value in the treatment of the disease induced experimentally in guinea-pigs. Reiter (*Deut. med. Woch.*, October 19, 1916, xlii, No. 42, p. 1282) states that an active vaccine can be made with the *Spirochæta nodosa* which will protect against Weil's disease.

The symptoms of the disease rapidly subside under treatment with a combination of arsenic and mercury, according to Carpi (*Policlinico*, July 29, 1917, xxiv, No. 31, p. 949), with no by-effects even when the urine showed much albumin and tube-casts. Bonini

Digitized by Google

(*Gaz. degli Osped. e delle Clin.*, March 1, 1917, xxxviii, No. 17, p. 273) obtained little benefit from mercury or arsenic, getting better results with serum from convalescents and immunized goats, when employed before the jaundice had appeared. Wilmaers and Renaux (*Arch. Med. Belges*, February, 1917, lxx, No. 2, p. 115) never ventured to use salvarsan or its substitutes on account of the evident injury to the kidneys and liver. Quinine never seemed to benefit the patients. Sodium salicylate and sodium sulphate, milk diet, and epinephrin to combat the low blood-pressure were the main reliance for symptomatic treatment, with tonics later.

PERTUSSIS

The enormous number of deaths from this disease annually (9000 to 10,000) must impress one with the importance of recognizing the disease early, so that the proper quarantining measures may be enforced during the most infectious period of the disease, and also that therapeutic measures may be instituted at the time when they are most likely to be productive of good results. That the preventive measures we employ in this disease are insufficient to control the disease has been emphasized by Morse (*Bost. Med. and Surg. Jour.*, 1916, 175, 723), who feels that the present method of diagnosis by the isolation of the *Bacillus pertussis* of Bordet and Gengou by cultural methods is too difficult and cumbersome for practical importance. That the cultural method may be employed satisfactorily for the diagnosis of the disease has been demonstrated by Chievitz and Meyer (*Ann. de l'Inst. Pasteur*, 1916, 30, 503), and, while the method may not be as simple a procedure as one might wish, it would appear as though the benefits to be obtained would warrant the expenditure of time and money required, in view of the seriousness of the disease.

The prophylactic inoculations with pertussis vaccine seem to afford considerable protection against the disease, as shown by the results in Rochester, N. Y., where 10,000 children were vaccinated with the development of the disease in less than 5 per cent., as reported by Galer (*New York State Jour. of Med.*, September, 1917, xvii, No. 9, p. 411). Shaw (*Am. Jour. Obst.*, July, 1917, lxxvi, No. 475) believes that the value of the vaccines as a prophylactic measure is undeniable, and that they should be administered to every child

Digitized by Google

exposed to whooping-cough. In the treatment of the disease he does not believe the results are so striking as in prevention, but even here there is a shortening of the course of the disease, with no effect on the number or severity of the paroxysms when administered after the whoop develops. The results obtained at the Whooping-cough Clinic of the Department of Health of the City of New York have been summarized by Luttinger (*Jour. Amer. Med. Assoc.,* May 19, 1917, lxviii, No. 20, p. 1461), who believes that the results obtained warrant the routine administration of pertussis vaccine for both curative and prophylactic purposes. In his opinion, the best time for administration of the vaccine treatment, except as a prophylactic, is the first and second week of the paroxysmal stage; when the proper vaccine is employed according to the method of the department the disease is materially reduced in duration and severity. Caronia (*Pediatria,* June, 1917, xxv, No. 6, p. 358) reports 61.28 per cent. cured, 32.25 per cent. improved, and only 6.45 per cent. not influenced by systematic vaccine treatment in 155 children with whooping-cough on whom it was employed. That more observations and more critical observations with controls for comparison must be made before the case can be considered made out for the curative and prophylactic value of a specific pertussis vaccine is the view of Von Sholly, Blum, and Smith (*Jour. Amer. Med. Assoc.,* May 19, 1917, lxviii, No. 20, p. 1451) after a careful study of a large number of patients.

Peutz (*Nederl. Tijd. voor Gen.,* March 10, 1917, 1, No. 10, p. 714) believed that the employment of serum from the blood of a convalescent child excited a mitigating or aborting influence when injected intramuscularly in the other children suffering with pertussis, although he considered the number of cases in which it was employed too small to exclude casual coincidence. Bleyer (*Amer. Jour. Med. Sc.,* July, 1915, cliv, No. 1, p. 39) could detect no appreciable influence from the injection of blood from convalescents in the fifteen cases in which he employed it.

DIPHTHERIA

The most important contributions during the past year dealing with diphtheria have undoubtedly been those dealing with the problem of the carriers. The treatment of chronic carriers is a very important matter, as the retaining of these cases under quarantine

Digitized by Google

for long periods of time is not always easy. The simplest and ideal method would be to spray the nose and throat with an antiseptic solution. Whether the dichloramine-T in oily solution suggested by Dunham and Dakin (*Brit. Med. Jour.*, 1917, i, 682) will be found to fulfil all the requirements only further experience will show. Antitoxin in the form of a powder has been employed by Benard (*Presse Méd.*, May 17, 1917, No. 27, p. 275) as an insufflating powder in chronic carriers with apparently good results, and Labbe and Canat (*Paris Méd.*, January 6, 1917, vii, No. 1) employed in a similar manner powder made from the serum of horses previously injected with diphtheria bacilli killed by heat. Bell (*Arch. Pediatrics*, November, 1916, xxxiii, No. 41, p. 836) considers broth cultures of *Staphylococcus pyogenes aureus*, when properly applied, a safe and successful method of combating the carrier problem. He states that the kaolin or other local treatment might be tried first. He claims best results from kaolin when the patient swallowed half a drachm of the powder every hour. Rabinoff (*Jour. Amer. Med. Assoc.*, December 9, 1916, lxvii, No. 24, p. 1722), after using various local measures, could find very little difference in them, except that kaolin gave very good results in adults. She believes that the removal of tonsils and adenoids should be resorted to when other methods fail. In this regard it is of interest to refer to the investigations of Brown (*Jour. Infect. Dis.*, October, 1916, xix, No. 4), who sectioned the tonsils from seven diphtheria carriers and demonstrated the presence of the organisms deep in the crypts in six of the cases. He concludes that tonsillectomy in diphtheria carriers removes an important focus of infection in which the bacilli lodge and multiply.

SYPHILIS

The clinical manifestations of this disease are attracting much more attention than formerly, probably on account of the fact that the early signs of the disease gain additional importance as the value of early treatment becomes more fully recognized. The various visceral findings in one hundred cases of syphilis are reported by Howard (*Amer. Jour. Med. Sc.*, July, 1917, cliv, No. 1, p. 64), who pays special attention to the cardiac conditions in these cases, giving the symptoms, signs, and results of treatment in the cases studied. In his description of *syphilitic aortitis* Elliott (*Amer. Jour. Med. Sc.*,

Digitized by Google

July, 1917, cliv, No. 1, p. 14) states that "There are certain physical signs which may be elicited by examination in most well-developed cases, but they are not of such a character as to especially indicate aortic syphilis. Among the most significant of these signs are a roughening or impurity of the first aortic sound and a sharp ringing aortic second tone, which, if the aorta is much dilated, may have a bell-like quality. Extension upward of percussion dulness over the sternum may exist, and there may be abnormal pulsations in the carotids or subclavian, with an impulse in the episternal notch. None of these signs is, however, sufficiently characteristic to furnish grounds for diagnosis of syphilitic aortitis, since they are frequently noted in aortic atheroma and high blood-pressure states not connected with syphilis." He also calls attention to the fact that the Röntgen ray can not be relied on for its detection in the early stage before mechanical defects begin to make their appearance. Röntgen diagnosis of aortic disease is obviously impossible until there is some dilatation, thickening, alteration of curve, or abnormal pulsation in the vessel.

In a clinical and röntgenological study of twenty-three cases of *syphilis of the stomach* Eusterman (*Am. Jour. Med. Sc.,* January, 1917, cliii, No. 1, p. 21) states that the condition is not of such infrequent occurrence as generally supposed. He states that results from antispecific treatment are encouraging in all but very advanced cases. Surgical interference is indicated in certain cases. Early diagnosis and intensive treatment invariably result in symptomatic cure and structural improvement. A case of hour-glass contraction of the stomach due to healing syphilitic ulceration of that organ is reported by Culler (*Jour. Amer. Med. Assoc.,* December 2, 1916, lxvii, No. 23, p. 1667). In a group of 600 cases of syphilis with strongly positive Wassermann reactions, White (*Bost. Med. and Surg. Jour.,* January 4, 1917, clxxvi, No. 1, p. 11) reports finding forty-four with prominent stomach symptoms, after excluding patients with hepatic cirrhosis, gumma of liver, nephritis, and tabes. Haller and Walker (*Amer. Jour. Med. Sc.,* June, 1917, cliii, No. 6, p. 824) report two cases which they believe were probably *syphilis of the intestines.* The tertiary manifestations of *syphilis in the liver* are illustrated by five cases in an article by Furno (*Policlinico,* August, 1917, xxiv, Med. Sect., No. 8). *Cirrhosis of the liver* in two children

Digitized by Google

with inherited syphilis is reported by Cozzolino (*Pediatria,* July, 1917, xxv, No. 7, p. 385), and the relation of icterus gravis syphiliticus to acute yellow atrophy of the liver has been studied by Wile and Karshner (*Jour. Amer. Med. Assoc.,* May 5, 1917, lxviii, No. 18, p. 1311).

From the results of 35,000 *Wassermann tests* Craig (*Amer. Jour. Syph.,* January, 1917, p. 192) makes the following deductions: If the diseases other than syphilis, that sometimes have given a positive result with the Wassermann test, can be excluded, a double-plus (four-plus of some writers) reaction is diagnostic of syphilis. He considers this type of reaction absolutely specific, whether symptoms are present or not, or whether there is or is not a history of infection. The three-plus and two-plus reactions he considers only as diagnostic in the presence of suspicious clinical symptoms or a clear history of infection. A comparative study of different antigens and of different temperatures of incubation in Wassermann tests has been carried out by Smith and MacNeal (*Jour. of Immun.,* December, 1916, ii, No. 1, p. 75, and *Jour. Infect. Dis.,* September, 1917, xxi, No. 3, p. 233). They found that the simple extract antigen, with the first incubation at 8° C., is more sensitive than the cholesterinized antigen at 37° C., and in this series it did not give any false positive reactions, according to the available evidence. Bohan and Lynch (*Jour. Amer. Med. Assoc.,* October 13, 1917, lxix, No. 15, p. 1220) report that they obtain a more delicate Wassermann reaction by employing increased quantities of blood-serum (1 Cc.). The causes of some of the errors with the Wassermann reaction are discussed by Telmon (*Presse Méd.,* July 19, 1917, xxv, No. 40, p. 411), with suggestions for their correction.

In a consideration of the serobiologic test Ball (*Jour. Amer. Med. Assoc.,* January 27, 1917, lxviii, No. 4, p. 262) concludes that they should be regarded in the same manner as the symptoms in a clinical picture. He further states that a spinal fluid examination should be made in all cases in which symptoms are present which are referable to the nervous system, unless the etiology of these symptoms is definitely known. An examination of the spinal fluid he considers the surest means we have at present of discovering the presence of latent syphilis, and in both early and late cases of syphilis before the patients are discharged from further treatment this ought to be done.

Digitized by Google

Hammes (*Amer. Jour. Med. Sc.,* November, 1917, cliv, No. 5, p. 625), in a study of the comparative value of the Wassermann, the colloidal gold, and other spinal fluid tests, states that the colloidal gold test is more delicate than the Wassermann test. Spinal fluids from luetics have given a colloidal gold luetic curve with a negative Wassermann, but he has never observed a normal colloidal gold curve with a positive Wassermann in the spinal fluid. Exceptions to this are the congenital luetics. Under antiluetic treatment he states there is usually a reduction in the cell count and globulin of the spinal fluid. Frequently the Wassermann becomes negative; rarely is there a change in the colloidal gold test. The literature is filled with various tests for the presence of syphilis which all their enthusiastic discoverers claim are more delicate than the Wassermann reaction. It would seem wiser to wait further confirmation before accepting too implicitly these various substitute tests. A few of the tests for syphilis suggested are: The coagulo reaction (Uemura, *Amer. Jour. Med. Sc.,* October, 1917, cliv, No. 4, p. 533); Bruck's serochemical test (Bruck, *Münch. med. Woch.,* January 2, 1917, lxiv, No. 1, p. 25, and Smith and Solomon, *Bost. Med. and Surg. Jour.,* September 6, 1917, clxxvii, No. 10, p. 321); the Hecht-Weinberg-Gradwohl test (Gradwohl, *Jour. Amer. Med. Assoc.,* February 17, 1917, lxviii, No. 7, p. 514). Mayer and Gourdy (*Semana Medica,* June 28, 1917, xxiv, No. 26, p. 779) have concluded their study of the lymphocytosis in syphilis. They believe the relative increase in lymphocytes in the blood is an earlier and more persistent sign than the Wassermann, and that its presence alone justifies the diagnosis of syphilis, even when no other sign or symptoms of it are present.

The relative value of *salvarsan* or *neosalvarsan* is still the subject of considerable discussion, and this question is further complicated by the manufacture of substitutes as the result of war conditions. Trimble and Rothwell (*Jour. Amer. Med. Assoc.,* December 30, 1916, lxvii, No. 27, p. 1984), in a comparative study of salvarsan and neosalvarsan in the treatment of syphilis, believe that the latter is the superior preparation, being much easier to administer, less likely to cause severe reactions, and producing a greater percentage of negative results. They lay stress on the importance of mercurial treatment after the neosalvarsan injections. Lüth (*Deut. med. Woch.,* December 21, 1916, xlii, No. 51, p. 1582) warns of the

Digitized by Google

dangers of insufficient salvarsan treatment, as, if the doses are too small to kill the spirochætes, they develop a strain of more resistant spirochætes, and the patient is thus worse off than if he had received no treatment at all.

That the intensive treatment, as accepted by modern methods (salvarsanization and thorough mercurialization during the early months), is protective in the largest percentage of cases is the belief of Wile and Elliott (*Jour. Amer. Med. Assoc.*, December 23, 1916, lxvii, No. 26, p. 1917). They state that with few exceptions the occurrence of late sequelæ in treated cases must be regarded as an indictment against the method of treatment. A comparison of results following the intravenous injection of salvarsan (or its substitutes) and subcutaneous or intramuscular injections of neosalvarsan (or its substitutes) has been made by Harrison, White, and Mills (*Brit. Med. Jour.*, May 5, 1917, i, No. 2940, p. 569). They found the intramuscular or subcutaneous injections of the neosalvarsan group were superior in immediate therapeutic effect, the spirochætes disappearing from syphilitic lesions as rapidly, and the Wassermann reaction was more quickly influenced by the neosalvarsan (or its substitutes) injections, both subcutaneous and intramuscular.

HEART-DISEASE

The study of the murmurs which arise as a result of valvular disease has received so much attention in the past that one would believe that nothing could be added to our present knowledge. Occasionally clinical studies are published containing information of practical value in the recognition of valvular lesions which may be new or may merely call freshly to our mind some previous, half-forgotten observation; in either case the reports being of value and interest. Tremolières, Caussade, and Toupet (*Presse Méd.*, August 9, 1917, xxv, No. 45, p. 465) assert that in young adults the murmur of aortic insufficiency is generally to be heard to the left of the sternum in the third interspace, instead of at the classic site, as taught in the text-books, the murmur being heard at this point only when the valvular trouble has reached an advanced stage. A general consideration of cardiac murmurs has been contributed by Laubry (*Paris Méd.*, August 4, 1917, vii, No. 31, p. 99), who lays special emphasis upon the importance of determining the special moment

Digitized by Google

during the heart cycle at which the murmur appears and its duration.

The view that "heart strain" among soldiers at the front was of rather frequent occurrence has been fairly generally accepted. Allbutt (*Brit. Med. Jour.*, August 4, 1917, ii, No. 2953) believes that the fretful heart, known as "soldier's heart," is not cardiac strain, and he suggests for this condition the term pono-palmosis (palpitation on effort). Heart strain, he says, is generally the result of some infection, is relatively infrequent, and does not constitute the bulk of the cases invalided from the army as "D. A. H."' In "D. A. H." the form of the heart is unaltered and the dyspnœa seems not to depend directly upon the heart. In many of these irritable hearts a systolic thrill can be felt. It is short, but often very distinct to the touch. Very often in these cases a systolic murmur at the apex is recorded, an alteration of the first sound, more like a prolongation of it, with some change of quality, than like a definite murmur of mitral regurgitation. He suggests that in these cases the papillary muscles and their cords may be a trifle slack, so that the mitral sheets shiver a little in the current, as a sail shivers when the boat gets near the wind. Aubertin (*Presse Méd.*, August 2, 1917, xxv, No. 44, p. 451), in discussing heart-disease in soldiers on the firing line, states that during the three years of war the men with heart-disease have been gradually sifted out and sent back to him as chief of a service for heart-disease. Many with mild functional derangements have promptly recuperated and returned to the front. Those with organic lesions have been apportioned to light duty or dismissed from the ranks altogether. Extrasystolic arrhythmia is generally labelled myocarditis, although his examination always failed to disclose anything abnormal in the functioning of the heart. This type of arrhythmia, he remarks, frightens the unwarned physician more than it frightens the patient. Amblard (*Paris Méd.*, August 18, 1917, vii, No. 33, p. 149) gives a number of charts registering the maximum and minimum blood-pressure and the pulse at rest, after moderate exercise and after violent exercise. He states that, whatsoever the pressure may be to start with, if the maximal pressure drops and the minimal rises only a very little after exertion, while the pulse becomes much accelerated, this indicates absolute insufficiency on the part of the heart, unless the significance is modified by long training in physical exercise. He calls attention to this increased frequency of the ven-

Digitized by Google

tricular wave as an aid in sifting out men whose hearts are not equal to the strain of exhausting exertion, although he admits that dyspnœa on effort is the true warning signal of functional insufficiency of the ventricle.

That *auricular fibrillation* is a relatively common affection is the opinion of Levine (*Amer. Jour. Med. Sc.,* July, 1917, cliv, No. 1, p. 43), who states that its importance is also indicated by the fact that it is generally a permanent irregularity, and, if untreated, seriously embarrasses the circulation. At the same time he believes it can be said that no group of cardiac cases responds so well to proper treatment. He holds that syphilis plays an unimportant rôle in the etiology of this condition, and that the transient form is much more common than is ordinarily believed. In his study of 128 consecutive cases he found that about one-third of the cases of persistent auricular fibrillation have had one or more attacks of rheumatic fever or chorea and show clinical signs of chronic organic mitral endocarditis, their average age being about thirty-seven years. About one-third of the cases have not had rheumatic fever or chorea, and show no signs of chronic organic mitral endocarditis, their average age being about fifty-eight years. He further states that most patients with organic mitral disease develop mitral stenosis, and only a small number reach the age of fifty years. Chronic organic mitral endocarditis is quite infrequently found in patients over fifty years of age, either clinically or at post-mortem. Sutherland (*Lancet,* London, March 17, 1917, i, No. 4881, p. 401) describes several cases of acute development of auricular fibrillation and rapid cardiac failure. One of the cases he reports illustrates that type of attack of cardiac failure which formerly would have been described as due to "broken compensation," and would now be described as due to the "onset of an abnormal rhythm," which in this case was auricular flutter or fibrillation. The term "failure of compensation," he believes, is wrong in such cases, because the compensatory changes have not broken down. The most effective action of digitalis in auricular fibrillation, Cushny (*Lancet,* June 9, 1917, i, No. 4893, p. 865) believes, is the blocking of impulses from the auricle. Another result of digitalis on the animal heart is the increase in the strength of contraction.

Various species of Minnesota *digitalis* have been assayed by

Digitized by Google

Morris (*Jour.-Lancet,* March 15, 1917, xxxvii, No. 6, p. 176), who believes that they equal the purpurea, the form ordinarily used, being especially impressed with the species lutea. He emphasizes the necessity for greater care in the use of digitalis, the necessity for a standardized drug, and an accurate dosage. Redonnet (*Corr.-Blatt für Schw. Aerzte,* July, 1917, xlvii, No. 30, p. 974) believes the frog titration method for the standardization of digitalis preparations is useless and misleading. He believes that the physician should select some one preparation, the dosage of which he should master, his own experience with that preparation serving as a guide. A method of standardization of digitalis is described by Krogh (*Ugeskr. for Laeger,* March 29, 1917, lxxix, No. 13, p. 475) which he claims is more dependable than any other, the tests being made on the isolated heart of the frog. With the heart of *Rana esculenta,* or common frog, the preparation of digitalis or strophanthus can be estimated within 10 per cent. of strict accuracy.

The clinical and necropsy findings in a typical case of chronic endocarditis for which the *Streptococcus viridans* was unmistakably responsible is reported by Deus (*Corr.-Blatt für Schw. Aerzte,* October 28, 1916, xlvi, No. 44, p. 1473), in which it was evident that special circumstances and general depression of the vitality from some cause are necessary before this germ is able to proliferate in the blood. The rôle of the leucocytes and the effect of nuclein injections in the viridans endocarditis have been studied by Fox and Lynch (*Amer. Jour. Med. Sc.,* February, 1917, cliii, No. 2, p. 235). Twelve typical cases of subacute streptococcus endocarditis were studied bacteriologically by Kinsella (*Arch. Int. Med.,* March, 1917, xix, No. 3, p. 367) in an effort to determine distinctive features in the group of streptococci associated with this condition. The streptococci isolated in pure cultures belong to the saprophytic types, according to Andrewes and Horder's classification, and are of low virulence, are non-hæmolytic, and may or may not be green producers. Biochemical and immunologic tests failed to show any constant identity between the individual streptococci concerned in producing this disease.

BLOOD-PRESSURE

The appreciation of the significance of blood-pressure is materially helped by a grouping of the cases according to the etiologic factors or

Digitized by Google

the distinguishing clinical features. From a study of 150 cardiovascular cases Stone (*Amer. Jour. Med. Sc.*, February, 1917, cliii, No. 2, p. 240) suggests the following classification: (1) The *cerebral* or *cerebrorenal type of hypertension,* with vascular disease and evidence of damage to the arteries in general and to the kidneys in particular. (2) *The cardiac type of hypertension,* without evidence of vascular disease and its associated nephritis, death usually resulting from myocardial exhaustion. (3) *The cardiac type without hypertension but with increased pressure ratio,* valvular and myocardial cases which necessitated increased cardiac work. (4) *The cardiac type without hypertension but with decreased pressure ratio.* This group comprised those patients with dilatation or those in whom marked evidences of myocardial exhaustion had occurred. Stone concludes that too much reliance should not be placed upon blood-pressure variations as a guide to the condition of the circulation in any particular case, for such variations are of value only when associated with all other data. Warfield (*Amer. Jour. Med. Sc.*, September, 1917, cliv, No. 3, p. 414) divides high pressure cases into three groups, called (*A*) chronic interstitial nephritis, (*B*) hereditary or cerebral type, and (*C*) arteriosclerotic or cardiac type. The term "cardiorenal disease" he would reserve for the cases in Group A which suffer from cardiac decompensation; the term "hypertensive cardiovascular disease" for cases of Group B. "Myocardial insufficiency" covers most of the cases in Group C. He also states that in blood-pressure reading, the whole record should be taken—systolic, diastolic, pulse-pressure, and pulse-rate, the diastolic and pulse-pressure giving more information than the systolic pressure. Warfield (*Jour. Amer. Med. Assoc.*, March 17, 1917, lxviii, No. 11, p. 824) states that high pulse-pressure is invariably accompanied by increased size of cavity of left ventricle, definite dilatation of arch of aorta, bronchial or tubular breath-sounds heard over the manubrium, and increase in size of all distributing arteries. Some of these can always be determined, and frequently all of them can be found.

A study of the arterial sounds has been made by Roberts (*Jour. Amer. Med. Assoc.*, September 15, 1917, lxix, No. 11), who found little evidence of a relation between arterial sounds and blood-pressure, except that the higher the pressure and the greater the pulse

Digitized by Google

amplitude, the more apt are sounds to exist in the femoral arteries. He believes it probable that the murmur over the brachial artery heard in taking blood-pressure is due to the constriction of the artery, and that the sound is due to transmission from closure of the aortic valve. Cook and Taussig (*Jour. Amer. Med. Assoc.,* April 14, 1917, lxviii, No. 15, p. 1088) report that in the occasional case (5 per cent. of all cases) an error may be made in taking the blood-pressure by failure to appreciate the fact that the second phase (auscultatory method) may be very faint to silent, leading to a false systolic reading.

The effect of tobacco smoking on the blood-pressure has been studied by Thompson and Sheldon (*New York State Jour. of Med.,* February, 1917, xvii, No. 2) with varying results, even in the same patient when taken at long intervals. Some showed a rise, some showed a fall, and some had a stationary systolic pressure. They believe it undesirable for any one having a constant systolic pressure much above 200 to smoke, and smoking is equally undesirable for any one having a constant initial pressure above 160 mm. when the use of tobacco is found uniformly to produce a considerable rise in blood-pressure. Parkinson and Koefoed (*Lancet,* August 11, 1917, ii, No. 4902, p. 232) record that one of the immediate effects of cigarette smoking in healthy men and in cases of "soldier's heart" was to raise the systolic blood-pressure by 5 to 10 mm. Hg, and the diastolic by 5 mm. in both groups. Excessive cigarette smoking, they believe, is not the essential cause in most cases of "soldier's heart," but, in their opinion, it was an important contributory factor in the breathlessness and precordial pain of many of them. Heiner (*Military Surgeon,* April, 1917, xl, No. 4, p. 378) calls attention to the rise in blood-pressure resulting from the exercise after meals.

In referring to the use of *camphor in cardiovascular disease,* Marfori (*Policlinico,* June 17, 1917, xxiv, No. 25, p. 785) states that in valvular disease, when the predominating disturbances are hypertensive in the right ventricle and lesser circulation, camphor is the most rational and effective treatment. He believes it can also be given with advantage in cases of high arterial pressure from hypertrophy of the heart or vascular spasms, as with the high pressure of the menopause, with arteriosclerosis, etc. The influence of large doses of *digitalis* and digitoxin on the blood-pressures in man has been studied by Eggleston (*Jour. Amer. Med. Assoc.,* September 22,

Digitized by Google

1917, lxix, No. 12, p. 951), who concludes that they have no direct action on the vessels, but that digitalis, by improving the circulation, leads to improved pulmonary ventilation with the relief of cyanosis and the abolition of the vasoconstrictor effect of carbon dioxide on the centre. Danielopolu (*Arch. des Mal. du Cœur,* May, 1917, x, No. 5, p. 228), from his clinical study upon this drug, believes that small doses of digitalis may reduce the tension materially in cases of high blood-pressure while the diuresis increases and the general condition improves. In the management of the early stages of hypertensive cardiovascular disease Thayer (*Southern Med. Jour.,* May, 1917, x, No. 5, p. 367) lays stress upon the importance of making the patient appreciate that the essential in life for him is moderation in everything—eating, drinking, tobacco, mental or physical effort.

NEPHRITIS

In the estimation of the state of renal function Ambard's coefficient (especially in its extreme limits) is regarded by Nakagawa (*Brit. Jour. of Surg.,* January, 1917, iv, No. 15, p. 386) as a very reliable method, although of a constant normal value does not necessarily imply freedom from disease. The coefficient of urea excretion has been studied by Lewis (*Arch. Int. Med.,* January, 1917, xix, No. 1, p. 1) in a number of different conditions, and he states that, while the coefficient is subject to certain variations in normals, any value below 0.06 or above 0.09 should be regarded as abnormal unless the excessive variation can be readily explained. He believes the prognostic value of the coefficient is considerable, values above 0.2 being seen only in the severe cases and persistently above 0.3 only in persons with a maximal impairment of renal function. He warns that to determine an accurate prognosis repeated determinations are essential. Smith (*Jour. Amer. Med. Assoc.,* January 27, 1917, lxviii, No. 4, p. 278) has reported the results of investigating 150 cases in which the renal function was studied by an index of urea excretion derived from Ambard's law by McLean.

Pirondini (*Policlinico,* December, 1916, xxiii, Surg. Sect., No. 12, p. 368) reports in detail four cases in which he has applied his urea test for kidney functioning, which consists in the administration of 300 Cc. of distilled water in which have been dissolved 10 Gm. of urea. He found that the test gave most instructive findings, harmonizing with the Ambard index throughout.

Digitized by Google

A simple, accurate method for the determination of urea in the blood has been devised by Landolpe (*Semana Medica,* October 5, 1916, xxiii, No. 40, p. 337). He mixes 2 Cc. of the serum with 2 Cc. water from 1.5 to 2 Cc. of pure hydrochloric acid. This is brought to the boiling-point for a moment and then filtered through a smaller filter with folds. It speedily filters through, and the residue on the filter is washed with 4 Cc. water. The filtered fluid is treated directly with 20 or 30 Cc. of sodium hypodromite in the A. Robin ureometer. Practically all of the nitrogenous compounds capable of yielding nitrogen as urea are eliminated by this procedure, which he thinks reduces the sources of error to the minimum.

The nephritis test meal of Hedinger-Schlayer-Mosenthal has been employed by Desha, McElroy, and Fontaine (*Southern. Med. Jour.,* December, 1916, ix, No. 12, p. 104) in thirty-six cases, the results demonstrating its value in diagnosis and prognosis, agreeing in general with the findings from the phenolsulphonephthalein and non-protein nitrogen determinations. While the test meal gave more information than either of the other two tests, they did not believe that it entirely replaced them.

The phenolsulphonephthalein test has become very generally employed as an index of renal function, the results being interpreted upon the basis that a retention of more than 20 to 40 per cent. within two hours after injection is an indication of deficient functional activity. The experiments of Kendall (*Jour. Amer. Med. Assoc.,* February 3, 1917, lxviii, No. 5, p. 343) suggest that there may possibly be certain factors, other than those connected with renal function, which may favor the retention of this reagent in the body. If his investigations are confirmed by further study it may be necessary for us to change our views in regard to this test in regard to its indications of renal insufficiency and accept only the positive result—that is, the excretion of 60 to 80 per cent. within two hours —as an indication of sufficient renal activity. The phenolsulphonephthalein elimination in children has been studied by Gittings and Mitchell (*Amer. Jour. Dis. of Children,* September, 1917, xiv, No. 3, p. 174) in a series of seventy-five patients, ranging from three weeks to ten years of age, all of which showed definite renal disease. They noted no distinct difference in the phenolsulphonephthalein elimination of patients with albumin and casts in the urine (apart from the

Digitized by Google

true nephritic groups) and of those whose urinary findings were negative.

The clinical value of the method of measuring sodium chloride excretory function as introduced by McLean (*Jour. Exper. Med.*, 1915, xxii, 234) has been investigated by Wolferth (*Amer. Jour. Med. Sc.*, July, 1917, cliv, No. 1, p. 84). He finds that an elevated plasma chloride threshold, when circulatory disturbances can be excluded, is valuable evidence of the presence of nephritis. A normal threshold may be found in cases with marked impairment of ability to excrete chlorides, particularly if the patient has been kept on a régime including salt-free diet and measures to stimulate elimination. Sodium chloride added to the diet is sometimes excreted as completely by impaired kidneys working under the stimulation of a high chloride content of the plasma as by normal kidneys working under normal threshold; added chloride may be retained when the threshold is normal. Therefore the information gained by both methods of study is desirable. Chloride excretory function is impaired in nearly all cases of nephritis, and is much more disturbed in eclampsia than is urea excretory function. One of the most striking clinical manifestations of chronic parenchymatous nephritis is the development of œdema or anasarca.

Epstein (*Amer. Jour. Med. Sc.*, November, 1917, cliv, No. 5, p. 638) reviews the various theories in regard to the causation of œdema, and then proposes a hypothesis of his own, which is briefly as follows: "The loss of protein incurred by the blood-serum through the continuous albuminuria causes a decrease in the osmotic pressure of the blood, which fact favors the absorption or imbibition and retention of fluid by the tissues." Another factor which he considers important in the chemical and physical pathology of the disease is the remarkable increase in the lipoid content of the blood. On the basis of the above observations he suggests two methods in the treatment of these cases: (1) Massive infusion or transfusion of healthy blood, accompanied by the removal of equal quantities of blood from the patient, and (2) the proper administration of a high protein and fat-poor diet, the latter being the most important. The number of cases he has treated by this method thus far is not large, but the results obtained have been very encouraging.

The general principles upon which the management of renal cases

Digitized by Google

is based have been described in detail by Umber (*Berl. klin. Woch.*, November 20, 1916, liii, No. 47, p. 1261). He groups the pathologic kidneys under three headings: (1) Those with degenerative processes in the epithelial segments of the kidney—the nephroses; (2) those with inflammatory processes in the glomeruli; and (3) those with primary arteriosclerotic changes in the smaller kidney vessels. He describes the treatment indicated in each group of cases, as with a knowledge of the portion of the kidney affected it is possible to so direct treatment as to spare the special function impaired. Chace and Rose (*Jour. Amer. Med. Assoc.*, August 11, 1917, lxix, No. 6, p. 440) describe in detail a dietetic treatment for nephritis which they have employed in advanced cases of interstitial nephritis with encouraging results. They lay special stress upon the importance of a well-varied diet. At least one hot dish is provided each day by giving a bowl of cream soup. Green vegetables are given to bring the iron intake in excess of 15 mg. per day. The sum total of the day's ash constituent should be decidedly alkaline in reaction and rich in calcium. Foods high in phosphorus are discriminated against, though not strictly barred, as are also foods of striking flavors. The day's energy requirement should add up to at least 2000 calories, and the protein should not exceed 60 Gm.

The *etiology of nephritis* is a subject which has attracted considerable attention in the past few years; the difficulties in arriving at a definite conclusion as to the factor which is to be held responsible for the renal process in any given case, and the questionable importance of syphilis in these cases, are the chief points brought out in a study by Elliott (*Jour. Amer. Med. Assoc.*, June 30, 117, lxviii, No. 26, p. 1955) of forty cases of chronic nephritis and sixty-eight cases of hypertensive cardiovascular-renal disease. Ophüls (*Jour. Amer. Med. Assoc.*, October 13, 1917, lxix, No. 15, p. 1223) describes a well-defined disease of the kidneys caused by general sepsis arising from some infected focus and often made progressive by the persistence of such a focus. He states that, since the glomeruli in this disease show the most characteristic and constant lesions, we may speak of it as glomerulo-nephritis, and, as the lesions are so distinctly of an inflammatory character, as true nephritis. The disease occurs in three forms: the acute, the subacute, and the chronic type. The characteristic glomerular lesions may be reproduced in animals

Digitized by Google

by injection of bacteria into the blood stream. The majority of cases in men are due to a streptococci, but other bacteria may cause similar lesions in the kidney and elsewhere. Many of the chronic cases seem to be caused by a peculiar form of chronic suppurative tonsillitis due to diplostreptococcic infection. Major (*Jour. Med. Res.*, 1917, xxxv, 349, and xxxvii, 125) reports the successful production of glomerulo-nephritis in rabbits by repeated intravenous injections of *Staphylococcus aureus* toxins following a preliminary injection of uranium nitrate. He later reported similar lesions resulting from the intravenous use of *Bacillus mucosus capsulatis*. Faber (*Jour. Exper. Med.*, August, 1917, xxvi, No. 2) has found that diphtheria toxin, injected intravenously into rabbits in single doses, produces lesions which are first evident in the endothelium of the tufts and possibly in the intertubular capillaries, the severity of the lesion being roughly proportionate to the amount of toxin injected.

The possibility of differentiating pure hypertrophy of the heart from that with contracted kidney, and the present status of our knowledge as to the causes of hypertonia, are discussed by Munk (*Med. Klin.*, December 24, 1916, xii, Nos. 51 and 52). He states that in many cases it is a mistake to assume a contracted kidney from a certain stage of arterial hypertension and hypertrophy of the heart; in certain others it is premature. In three cases reported in detail the clinical diagnosis of contracted kidney was not confirmed by autopsy, the kidneys being practically intact, but the suprarenals were the seat of a tumor. From a study of one hundred cases Stark (*Jour. of Lab. and Clin. Med.*, November, 1916, ii, No. 2, p. 134) states that in the differential diagnosis of kidney lesions the urinary picture is of practically no importance.

TRENCH NEPHRITIS

The nephritis which has been attacking the troops on every front has all the appearances of an infection (Brown, *Practitioner*, London, February, 1917, xcviii, No. 2). With one exception every one of the twenty-seven cases of trench nephritis examined by Thornley (*Brit. Med. Jour.*, December 16, 1916, ii, No. 2920, p. 836) has shown the presence of an identical coccus in the blood. Seen under the highest powers of the microscope, the organism is seen to be an

Digitized by Google

extreme minute diplococcus, with adjacent surfaces flattened against each other, usually occurring singly or in groups, seldom in chains. They are non-motile, have no capsules, and do not stain. He also describes its cultural characteristics in detail. From the fact that they cultivated typhoid bacilli from the urine of some of their cases of acute nephritis in troops on the eastern front, Rostoski and Pantaenius (*Deut. med. Woch.*, December 14, 1916, xlii, No. 50, p. 1543) believe that typhoid bacilli are responsible for some of the cases at least.

While numerous writers view the acute nephritis occurring among the troops as a distinct clinical entity, others are inclined to view it as merely an ordinary type of nephritis brought on by the hardships and exposure, possibly in individuals whose kidneys had previously not been entirely normal. Teissier (*Bull. de l'Acad. de Méd.*, June 26, 1917, lxxvii, No. 26, p. 806) states that there is nothing specific about the kidney troubles of the men in the trenches except the high nitrogen content of the blood, from 0.7 to 1.35 Gm., while the content of the urine is below normal, although the permeability of the kidneys seems unimpaired. The general clinical course and types of the disease are described by Ameuille (*Presse Méd.*, November 2, 1916, xxiv, No. 61, p. 489) and Sorel (*Paris Méd.*, June 23, 1917, vii, No. 25, p. 518). That 33 per cent. of the kidney disturbances noted in the soldiers on active service are merely simple albuminuria, according to Tremolières and Caussade (*Annales de Méd.*, January-February, 1917, iv, No. 1, p. 73). In 67 per cent. they found actual subacute nephritis with a tendency to dropsy. After six weeks or two months of hospital care the albuminuria disappears in about 10 per cent. It persists in 25 per cent. in minute proportions, but varying with fatigue and diet. The men with subacute nephritis were left with a tendency to œdema in about 44 per cent. of the cases. If there is no cardiovascular derangement, the only relics left may be a residual albuminuria or albuminous nephritis. In 7 per cent. the nephritis passed into a chronic stage, some cases proving speedily fatal.

The treatment of these cases after they have passed the acute stage and have been sent to the base hospital is described at length by Clarke (*Brit. Med. Jour.*, August 25, 1917, ii, No. 2956, p. 239). The treatment consisted of rest in bed; a fixed diet of 2½ pints of

Digitized by Google

milk, 6 ounces of bread, 1 ounce of rice, ½ ounce of butter, 4 ounces of potatoes, 4 ounces of greens, 1 ounce of jam, and fruit occasionally. As improvement took place the bread was increased to 8 ounces and the yolk of one or two eggs was added. Later on, 4 ounces of cooked fish or chicken were added, and sometimes more bread and butter. Salt was not used as a condiment nor added by the cook, except in cooking green vegetables. The amount of water was not restricted when once the kidney began to secrete freely. Many of the patients had only a simple diaphoretic mixture with a saline or other purgative required. Hot-air baths were used when free diaphoresis was necessary. Nitroglycerin was given when the blood-pressure was raised. Iron was given in the later stages if there was anæmia. In many cases with deficient urinary excretion on admission, sodium carbonate was used with very satisfactory results in establishing a free flow of urine.

Magnus-Alsleben (*Münch. med. Woch.*, December 12, 1916, lxiii, No. 50, p. 1774), in his effort to spare the diseased partial function, calculated the amount of fluid allowed strictly according to the output of the urine, and the nitrogen and salt in the food were materially restricted, although the supply of calories was ample. He states that the favorable influence of this function-sparing diet was remarkable, copious diuresis soon setting in without other measures, and the blood-pressure dropping to normal. His experience with Volhard's method of treatment, which consists in giving the men absolutely nothing to eat or drink for three or four days and then letting them drink copiously, was very disappointing. The flood of diuresis and decline in blood-pressure which Volhard claims as a result of this treatment did not always take place.

DIABETES MELLITUS

The factor, or group of factors, responsible for the development of diabetes mellitus is still unrecognized. It is interesting, however, to study these cases with the object of obtaining some indication for the further study of the etiology of the process. The obtaining of a positive Wassermann reaction in a certain proportion (6 to 10 per cent.) of the cases has suggested the possibility of syphilis being responsible for some of the cases. From his experience with anti-syphilitic treatment in a small series of diabetics with a positive

Digitized by Google

Wassermann reaction Rosenbloom (*Jour. Amer. Med. Assoc.*, April 28, 1917, lxviii, No. 17, p. 1232) reports that in the cases he studied it could not be stated definitely that the diabetes was due to syphilis, as there was no increase in tolerance for carbohydrate in any of his cases after syphilitic treatment. An article is contributed by Williams (*Amer. Jour. Med. Sc.*, September, 1917, cliv, No. 3, p. 396) in which he emphasizes the importance of both arteriosclerosis and infection in diabetes. He suggests that the possible prevention or control of these factors would be a step in the direction of preventing the metabolic collapse which we call diabetes.

The early diagnosis of diabetes is undoubtedly extremely important from the standpoint of treatment, therefore the simple method involving strain on the capacity of the tissues to utilize glucose, as suggested by Addis (*Jour. Amer. Med. Assoc.*, July 14, 1917, lxix, No. 2, p. 109), for the early detection of this condition, is of interest. While the method he employs is not so accurate as certain other complicated methods, this is more than counterbalanced by its applicability and simplicity. He states that his method is better than the common practice of giving 100 Gm. of glucose, as glycosuria resulting from such a large single dose may be an epinephrin or a renal as well as diabetic glycosuria. It is the steeply rising curve of sugar excretion, not the mere presence or amount of sugar in any one collection of urine, which is of diagnostic value.

The *Allen treatment*, or the "treatment by alimentary rest," as suggested by Leyton (*Brit. Med. Jour.*, February 24, 1917, No. 2930, p. 252), when thoroughly and carefully followed out will undoubtedly improve and render sugar-free the diabetic patients. The chief difficulty seems to be in making the patients and doctors appreciate the importance of paying strict attention to the diet in the after-treatment (Martin and Mason, *Amer. Jour. Med. Sc.*, January, 1917, cliii, No. 1, p. 50), success largely depending upon the educability and the personal equation of the patient and on the ability and enthusiasm of the physician (Greeley, *Jour. Amer. Med. Assoc.*, June 9, 1917, lxviii, No. 23, p. 1685). Cammidge (*Brit. Med. Jour.*, April 14, 1917, i, No. 2937, p. 503) does not believe this method of treatment best for all forms of glycosuria, but considers that it marks a great advance in the available methods, and gives results that can be obtained, in many instances, by no other means. It must be used

Digitized by Google

with judgment, however, and one should always bear in mind that the keynote of the treatment is undernutrition. A practical question that sometimes arises is whether a controlled, and maybe mild, glycosuria with an adequate diet and reasonable enjoyment of life is not preferable to the theoretical ideal permanently sugar-free urine, which can only be secured by a diet that will not satisfy the pangs of hunger, and requires constant close supervision. The answer will depend on circumstances and the temperament of the patient. These should be considered carefully before advising the treatment, as, once it is begun, it must be persevered with, since a return to an ordinary carbohydrate-free diet always brings about a rapid increase in the acidosis, with excessive tissue waste and death from diabetic coma.

The rôle of fat in diabetes is the title of an extensive article by Allen (*Amer. Jour. Med. Sc.*, March, 1917, cliii, No. 3, p. 313), in which he considers fat in diabetes in its relation to lipæmia, acidosis, and carbohydrate utilization. His experiments have shown that the appearance of spontaneous downward progress observed in human patients can be exactly imitated in dogs. It is not positive that the undernourished dogs will be able to live indefinitely. He believes that it has been conclusively demonstrated that the attempt at high nutrition, even with fat, produces in these dogs an appearance of spontaneous aggravation of condition as striking as anything witnessed in human patients, and that this result can be prevented, at least for periods of years, by limiting the total caloric intake and the body mass to correspond to the assimilative function. Restriction of single foods, carbohydrate or protein, suppresses symptoms temporarily, but lightening the total load upon the assimilative function is the only present means by which it may be hoped actually to halt the diabetic process. He states that "what the diabetic organism is unable to assimilate without restriction is not any particular kind of food, but food as such."

As a critical study of diabetes mellitus and *phlorizin diabetes* has led to the conclusion that glucose formation from protein in both these conditions is essentially the same, Janney (*Arch. Int. Med.*, November, 1916, xviii, No. 5, p. 584) believes it justifiable to apply to human diabetes the very much more accurate results which can be obtained in phlorizin experiments. He gives in full the results of new experiments relative to glucose formation from protein foods

Digitized by Google

in addition to the results of previous investigations in which isolated proteins were found to yield large amounts of glucose in metabolism, varying from 48 to 80 per cent., according to the protein examined. The animal or vegetable origin of proteins bears no relation to their ability to produce glucose in the animal organism, contrary to existing opinions, this function being found to be mainly dependent on the amounts of sugar-yielding amino-acids entering into the constitution of these various proteins.

The influence of renal function on hyperglycæmia and glycosuria in diabetes mellitus has been studied by Epstein (*Amer. Jour. Med. Sc.*, July, 1917, cliv, No. 1, p. 103). He states that a condition simulating renal diabetes—*i.e.*, a glycosuria without hyperglycæmia—may occur in diabetes mellitus. This is brought about by an increase in blood volume which reduces the concentration of the blood-sugar, and the consequent fall in its percentage masks the hyperglycæmia. In order, therefore, to prove the existence of true renal diabetes, it is necessary to show that the total sugar content of the blood is not increased above normal. The hyperglycæmia without glycosuria, which is of frequent occurrence in diabetes mellitus, he states, is to be interpreted as a condition of increased "tolerance" of the kidneys for sugar and not that of "lessened permeability." True nephritis need not interfere with the elimination of sugar. Testing the kidney function by means of phenolsulphonephthalein in diabetes mellitus he considers a useful procedure, as it aids in understanding the relation of the hyperglycæmia to glycosuria, being particularly helpful in those cases in which a fall in the urinary sugar is associated with a rise in the blood-sugar, thus yielding confirmatory evidence of the fact that the elimination of glucose is interfered with. Janney (*Amer. Jour. Med. Sc.*, January, 1917, cliii, No. 1, p. 44) considers that the "glucose-nitrogen" ratio properly established for fasting patients is a valuable aid in the study of diabetes. In general it may be stated that the more nearly the glucose-nitrogen ratio ranges about 3.4 : 1, the graver becomes the prognosis.

That the *coma of diabetes* may not be due exclusively to the presence of the acetone bodies and acidosis is the belief of Pauly and Boulud (*Lyon Méd.*, March, 1917, cxxvi, No. 3, p. 118); at least in certain cases their rôle may be accessory, and some other explanation must be sought for the coma. In a case which they report in

Digitized by Google

detail the coma appears to have been the work not of the acetone bodies but of the peptids resulting from defective metabolism of albuminoid substances. In an article describing a case of fatal diabetes with large-cell hyperplasia of the spleen, lymph-nodes, and liver, Williams and Dresbach (*Amer. Jour. Med. Sc.*, January, 1917, cliii, No. 1, p. 65) discuss briefly some of the newer views regarding fat metabolism. They report that overfeeding with fat increases acidosis in diabetes and probably bears some relation, as yet not understood, to lipoidæmia. Martin and Mason (*Amer. Jour. Med. Sc.*, January, 1917, cliii, No. 1, p. 50), in an article on the starvation treatment of diabetes, report that in one persistent case of very mild diabetes, with prolonged mild acidosis, interrupted periods of a fat-free diet seemed especially useful in clearing up remnants of the acidosis. They found that sometimes acidosis was initiated by the starvation, at other times a preëxisting acidosis was increased, though usually it disappeared. Epstein and Felsen (*Amer. Jour. Med. Sc.*, January, 1917, cliii, No. 1, p. 58), in their study on the influence of acidosis on hyperglycæmia in diabetes mellitus, also found that the withdrawal of food from certain cases provokes or aggravates the acidosis. Liberal, but judicious, administration of carbohydrates may control the acidosis provoked by withdrawal of carbohydrates or complete fasting, thus leading to a general amelioration of the diabetes. A progressive rise in the blood-sugar content, associated with a gradual fall in the alveolar carbon dioxide, is indicative of impending coma. Underhill (*Jour. Amer. Med. Assoc.*, February 17, 1917, lxviii, No. 7, p. 497) finds that the ingestion of large doses of sodium bicarbonate has a marked influence in decreasing glycosuria in severe diabetes and in maintaining the diabetic individual in a state of comparatively good health and vigor. This effect he ascribes to the neutralization of the exogenous and endogenous acid of the organism. In mild diabetes there is evidence that carbohydrate tolerance may be significantly increased by large doses; which conclusions he believes are in harmony with experimental facts concerning the relation of acid-base equilibrium of the body to carbohydrate metabolism.

DIABETES INSIPIDUS

The view held by some investigators that this disease or disease syndrome is primarily the result of disease of the kidney is denied

Digitized by Google

by Christie and Stewart (*Arch. Int. Med.*, July, 1917, xx, No. 1, p. 10), who studied the regulation of the excretion of water in a case of diabetes insipidus. They obtained no indication that the condition was in any way associated with a pathologic alteration in the kidney. From his experiments with extracts of the pars intermedia and posterior lobes of the hypophysis, given by mouth, subcutaneously or intravenously, Motzfeldt (*Jour. Exper. Med.*, January, 1917, xxv, No. 1, p. 153) finds that they are able to check artificially induced polyuria. The effect is apparently prevented or delayed by division of the splanchnics, and is diminished by division of the renal nerves near the hilus, suggesting that their action is caused by stimulation of the sympathetic nervous system, the renal vasomotor system in this respect being of chief importance. These observations tend to bring the polyurias related to disorders of the nervous system and the polyurias of pituitary origin in closer contact. Eisner (*Deut. Arch. für klin. Med.*, 1916, cxx, 438) concludes, from his experiments, that extracts of the posterior lobe of the hypophysis will diminish urinary secretion and increase the concentration and specific gravity of the urine in this group of cases of diabetes insipidus (with changes in the central nervous system), but that the effect is only temporary, and therefore these extracts can not be regarded as an effective remedy, their value being as a diagnostic measure. Marañon (*Siglo Medico*, Madrid, January 20, 1917, lxiv, No. 3293, p. 36), from his experience with three cases, one of which was a boy, who developed polyuria after being shot in the head, with the bullet lodging in the sella turcica and blocking the egress of the pituitary secretion, believes hypophysis treatment is indicated in every case of true diabetes insipidus. While the effect is not lasting and the treatment must be repeated daily indefinitely, he believes that if the hypophysis function has not been entirely abolished, the organo-therapeutic stimulus may rouse it to approximately normal functioning, as occurred in one of his cases.

HEMORRHAGIC DISEASES

Interest in these conditions seems to centre around the grouping of the various cases into definite types, based on the deficient coagulation factor. An interesting review of the factors involved in coagulation, their relation to hemorrhagic disease, the method for

Digitized by Google

their determination, and an outline of therapy based on the blood findings, is contained in an article by Hurwitz (*Amer. Jour. Med. Sc.,* November, 1917, cliv, No. 5, p. 689). He believes that whole blood is at present the most logical and most efficacious therapeutic agent for the control of bleeding in the greatest number of patients showing hemorrhagic tendencies. A study of twenty-five cases of *purpura hemorrhagica* and *aplastic anæmia* has been made by Minot (*Arch. Int. Med.,* 1917, xix, No. 6, p. 1062), who gives a short classification of the types of these two conditions encountered, and suggests that instead of calling a group of disease conditions "purpura hemorrhagica" we use more specific terms and refer to cases of "insufficiency of the marrow, with especial involvement of the platelets or other formed elements in varying degrees."

Matteucci (*Gaz. degli Osped. e delle Clin.,* December 7, 1916, xxxvii, No. 98, p. 1539) recognized nine varieties of purpura, but states that they may be divided into two main groups—those with and those without normal conditions in blood-platelets. That the blood-platelet count should be made in every case with a hemorrhagic tendency is urged by Fonio (*Deut. med. Woch.,* November 2, 1916, xlii, No. 44, p. 1344). He gives a long report on the hemorrhagic cases treated intravenously by his extract of blood-platelets, believing it to be the simplest and easiest method of supplying the lacking blood-platelets when this seems to be the cause of the trouble, as in Werlhof's disease. In this condition the injections have to be kept up indefinitely, while in hæmophilia a permanent cure may follow one injection. The relation of blood-platelets to coagulation and their significance in purpura hemorrhagica and *hæmophilia* are discussed at length by Lee and Minot (*Cleveland Med. Jour.,* February, 1917, xvi, No. 2, p. 65), who state that, as these conditions are associated with a diminution in the number of platelets or an abnormally low activity of these constituents of the blood, the rational treatment of these conditions consists in an attempt to supply the platelet defect. They call attention to the marked benefit which may follow the local use of tissue juice in these cases to check bleeding. While Klinger (*Deut. med. Woch.,* December 21, 1916, xlii, No. 51, p. 1585) has pointed out that blood-platelet extract by the mouth does not affect the coagulating time of the blood, its administration by this route has proved of value in gastric hemorrhages (Bräutigan, *Münch. med.*

Digitized by Google

Woch., November 21, 1916, lxiii, No. 47, p. 1656, and Meyer, *Münch. med. Woch.*, December 26, 1916, lxiii, No. 52). A further report on tissue juice made from brain (thromboplastin solution) is made by Hess (*Jour. Amer. Med. Assoc.*, December 9, 1916, lxvii, No. 24, p. 1717), who finds it of practical value in controlling hemorrhage whenever it can reach the site of the bleeding. In true hæmophilia he regards it almost as a specific hæmostatic.

PERNICIOUS ANÆMIA

The treatment of this condition must continue just as unsatisfactory in the future as it has in the past until investigation and study shed more light on its etiology. Squier (*Jour. Lab. and Clin. Med.*, May, 1917, ii, No. 8, p. 552) considers pernicious anæmia the result of gastro-intestinal disturbance, leading to destruction of mucosa sufficient either to allow undigested proteins to leak through into the blood stream, where their parenteral digestion liberates protein poisons, or to the absorption of known hæmolytic toxins produced in the course of intestinal putrefaction. He believes that splenectomy lessens the severity of the disease by increasing the resistance of the red blood-corpuscles to the hæmolytic agents. Larrabee (*Boston Med. and Surg. Jour.*, 1917, clxxvi, 553) gives a plan for the systematic treatment of pernicious anæmia, describing the dietetic and medicinal measures in detail. When the anæmia is rapidly progressive in spite of the measures suggested, especially in hemorrhagic and aplastic states, he believes transfusion should be done, and if one or more transfusions are not followed by remission he believes it is justifiable to remove the spleen. When no benefit is obtained from one transfusion, Archibald (*St. Paul Med. Jour.*, 1917, xix, 43) believes a different donor should be tried. He also states that, while it is impossible to predict the results of transfusion in the individual case, chronic cases with a history of remission are the most likely to respond to this method of treatment. Giffin (*Jour. Amer. Med. Assoc.*, February 10, 1917, lxviii, No. 6, p. 429) states that, while there is no evidence that splenectomy has cured pernicious anæmia, a review of thirty-one cases shows a definite gain in 78 per cent. of cases in the first three months' postoperative period; during the second three months' period 68 per cent. of living patients maintained their gain. Preoperative treatment, especially transfusions, he be-

Digitized by Google

lieves should be employed to influence the general condition of the patients and to improve the characteristics of the blood picture. The operative risk is increased when the hæmoglobin is below 35 per cent. and the red cells less than 1,500,000.

LEUKÆMIA

While the acute cases of leukæmia suggest the probability that this disease is due to an infection, Ward (*Brit. Jour. Children's Dis.*, January to March, 1917, xiv, Nos. 157 to 159), in a review of 1457 cases of all varieties, submits evidence which is almost entirely against the infective nature of leukæmia. Nicolaysen (*Norsk. Mag. for Laege*, July, 1917, lxxviii, No. 7, p. 769), in his study of three cases of acute leukæmia, was unable to cultivate any organism from the blood in two of them. In the third case no blood culture was made during life, but a Gram-positive diplococcus was found in all the organ sections. Röntgen exposures were applied without benefit in one of the cases. Ordway (*Bost. Med. and Surg. Jour.*, April 5, 1917, clxxvi, No. 14, p. 490) reports striking remissions from the use of radium in cases of leukæmia that have proved resistant to Röntgen-ray and benzol treatment. The blood picture becomes almost normal, glands and spleen are reduced almost to normal, and there is marked improvement in the general nutrition and strength of the patient under the radium treatment, the duration of the remission being variable.

PELLAGRA

Interest in this disease is chiefly centred in the question as to the cause of the condition—whether it is due to certain deficiencies in the diet or is an infectious process. The evidence presented is very contradictory and confusing, and at the present time the question is far from being definitely settled. Chittenden and Underhill (*Amer. Jour. of Physiol.*, August, 1917, xliv, No. 1, p. 13) have produced experimentally in dogs a pathologic condition which closely resembles human pellagra by feeding them on a diet consisting of boiled (dried) peas, cracker meal, cottonseed oil, or lard. They assert that infection plays no part in the production of the abnormal nutritive conditions of dogs which they describe. McCollum and Pitz (*Jour. Biol. Chem.*, 1917, 31, 229) urge that there is no reason to believe that pellagra is

Digitized by Google

due to a lack of a specific, unidentified dietary factor, a "vitamin." The report of Jobling, Petersen, Tucker, and Costen (*Jour. Infect. Dis.*, August, 1917, xxi, No. 2, p. 109) brings out several points which are apparently contradictory. A definite number of cases of pellagra develop in individuals partaking of a well-varied and wholesome diet, and instances have occurred of the disease developing in breast-fed infants of non-pellagrous mothers. On the other hand, at least half of the cases develop in persons living on a ration low in protein, high in carbohydrates, and monotonous in character, and the pellagrous condition is favorably influenced by a change in diet.

That pellagra is an infectious disease which spreads slowly, attacking only a small proportion of the population residing in the immediate vicinity, and that its spread is especially favored by unsanitary methods for the disposal of human wastes, is the contention of Siler, Garrison, and McNeal (*Arch. Int. Med.*, May, 1917, xix, Part 1, No. 5, p. 683, and August, 1917, xx, No. 2, p. 198). From his studies of this disease in Europe, the United States, and the Antilles, Sambon (*Presse Méd.*, December 18, 1916, xxiv, No. 70, p. 577) maintains that it is probably an infectious disease, possibly caused by some protozoön, which is transmitted by the sting of some winged insect. Tizzoni (*Policlinico*, March 11, 1917, No. 11, p. 337) declares that the germ he has described as the specific agent of pellagra was found present in the blood of all the numerous insane pellagrins examined at the Mombello Asylum. He states that the germ passes through three phases in its cycle of evolution: first, a bacillus, then a streptococcus, and, finally, a staphylococcus, changing from one phase to the other in irregular fashion. The blood and spinal fluid of pellagrins have been cultivated anaërobically by Francis (*Hyg. Lab. Bull.*, No. 106), somewhat after the method described by Noguchi for growing spirochætes. The blood of twenty-one patients and the spinal fluid of sixteen cases were cultivated in a total of 296 tubes with negative results. Goldberger (*Public Health Reports*, November 7, 1916, xxxi, No. 46) subjected sixteen volunteers to the blood, nasopharyngeal secretions, epidermal scales from skin lesions, urine, and fæces from pellagrins; employing the blood subcutaneously and intramuscularly, secretions were applied to mucosa of nose and nasopharynx, and scales and excreta were administered

Digitized by Google

by mouth. During a period of between five and seven months none has developed evidence justifying the diagnosis of pellagra. He believes that these experiments furnish no support for the view that pellagra is a communicable disease, and that they materially strengthen the conclusion that it is a disease essentially of a dietary origin, brought about by a faulty, probably "deficient," diet.

ANÆSTHESIA

A. O. Singleton, writing on *the increasing usefulness of nerve-blocking or regional anæsthesia* (*Texas St. J. Med.*, 1916, xii, 195) recommends the use of a one-fourth of one per cent. novocaine solution for infiltration, one-half to one per cent. for nerve-blocking, and a five per cent. solution for spinal anæsthesia.

Regnault (*Presse Méd.*, 1917, p. 396) *prefers local anæsthesia* and uses novocaine-adrenalin or novocaine-suprarenin.

Under such anæsthesia he has carried out major operations, such as arm amputations, foot amputations, appendicitis, ovarian cyst, etc. In 900 operations carried out during the war he has used local anæsthesia *in about three-fourths of the cases.*

H. P. Cole (*Tr. South. Surg. and Gynec. Assn.*, White Sulphur Springs, December, 1916) reports *a partial list of major operations performed under local anæsthesia,* many of which were selected because of grave contra-indications to general anæsthesia.

The list includes twenty-five cases of appendectomy for acute and chronic conditions, drainage of peritoneal abscesses, and general peritonitis. There were a number of exploratory operations, enterostomies, and gastro-enterostomies; eight cases of cholecystotomy, one removal of a forty-three-pound ovarian cyst, one nephrectomy, and a number of thyroidectomies. There was one case of suspension of the uterus and one removal of an ectopic gestation; there were also three cases of radical amputation of the breast and three cases of decompression of the skull. There were seven laparotomies performed under local anæsthesia during pregnancy, with no maternal mortality and with the loss of one fœtus.

There were forty-seven cases operated on between the ages of fifty and eighty-seven, almost exclusively selected for local anæsthesia because of cardiovascular or renal contra-indications to general anæsthesia.

Digitized by Google

J. Wiener relates *experiences with local anæsthesia in sixty operations for acute and chronic appendicitis* (*New York Med. Jour.*, 1917, cvi, 360). This is a record of forty-one chronic and nineteen acute cases. Of the acute cases, seven presented empyema, eight gangrene, two large abscesses, and two well-marked peritonitis. Little pain was experienced. *Some patients who complained during the operation later admitted that the pain was slight, but that they were afraid.* Adhesions were present in numerous cases. Recent ones could be separated without pain. When dense, novocaine was injected. Only small amounts of opiates were needed. Nausea and vomiting are rarely seen except in peritonitis and abscess cases: they may occur in neurotic cases. Postoperative distention is usually absent: many patients pass gas the day of operation. There was no mortality in the sixty cases.

The technic follows: Three-quarters of an hour before operation one-quarter grain of morphine is given hypodermatically, and usually repeated just before operation, unless the patient is drowsy. A one per cent. novocaine solution is used, to the ounce of which twenty drops of 1:1000 solution of epinephrin are added. The muscle-splitting McBurney incision is employed. The meso-appendix is injected as well as the wall-layers.

R. E. Farr describes *abdominal surgery under local anæsthesia* (*Journal-Lancet*, 1917, xxxvii, 353), saying that, whereas it is the custom of surgeons to limit the use of local anæsthesia to the cases in which general anæsthesia is contra-indicated, it is his belief that *the reverse should be true, and that general anæsthesia should be resorted to only when local anæsthesia is contra-indicated.*

The comparative safety of novocaine makes possible the use of the drug in large quantities: when so used in conjunction with ample incision, careful manipulation, vertical retraction, and an appropriate position of the patient, its scope is greatly broadened. Perfect anæsthesia results in *negative intra-abdominal pressure,* producing post-mortem-like repose, which permits direct visual examination, which is, of course, preferable to digital. With this method abdominal packs are not needed, except to prevent soiling. It has the advantages of avoidance of the immediate and remote dangers of general anæsthesia, excellent exposure and perfect repose of the viscera, greatly reduced trauma, and *a very marked decrease in such postoperative*

Digitized by Google

discomforts as gas, nausea and vomiting, with the resultant wound strain, in addition to the avoidance of loss of consciousness. *Children of all ages lend themselves especially well to the method.*

The time required for the administration of local anæsthesia is greatly reduced by the use of the *pneumatic injector,* two to five minutes being all that is necessary. The author has performed practically every abdominal operation by this method—some operations hundreds of times—and prefers it to all others. If the anæsthesia becomes inadequate for any case, general anæsthesia may be resorted to at any stage in the operation.

The *contra-indications to local anæsthesia* are largely limited to: (1) Psychic incompatibility, a small percentage of cases, not excepting children on this account; (2) pathology adherent to the posterior parietal peritoneum; (3) adherent malignant disease; and (4) very high-lying gall-bladders.

Leclerc, making *reflections on 200 cases of novocaine spinal anæsthesia* (*Lyon chir.,* 1917, xlv, 479), is of the opinion that this method, though not one of absolute security, yet renders great service, especially in cases of shock and wounds of certain regions.

The *site of injection* is the first or fifth lumbar space. *The higher level not affected by anæsthesia differs for each patient and is not in agreement with the quantity injected.* The most suitable level for spinal anæsthesia seems to be the first lumbar or the twelfth thoracic space.

The *advantages* are that: (1) It facilitates the change of the patient's position on the operating table and easily permits abdominal decubitus; (2) there is preservation of the laryngeal reflex which prevents asphyxia and postoperative bronchopneumonia; (3) in cœliotomy it avoids the thrust of abdominal viscera; (4) diminution or suppression of operative shock is the principal advantage.

The *disadvantages* are that: (1) For one or other reason, there may be a complete failure to effect anæsthesia: this, however, is very rare; (2) the anæsthesia may be insufficient as regards intensity or duration or extent of field.

As *complications,* there may be slight nausea or vomiting or headache. In one case there were deafness and labyrinthine phenomena; in six cases rhachialgia and meningitis; in two cases there was some strabismus. All these disappeared in the course of time.

Digitized by Google

AUTOGENOUS TRANSPLANTATION OF LIVING TISSUE

A. B. Kanavel reports his experiences with *transplantation of fat, fascia, and bone in various conditions* (*J. Mo. St. M. Assoc.*, 1917, xiv, 333).

1. *Transplantation of free flaps of fascia.* The largest percentage of cases in which this is of value occurs where there is living tissue on both sides of the flap. The edges should be tucked down so there is no rolling; good hæmostasis should be secured.

(*a*) In a case of *ventral hernia,* scar tissue was removed, the tissue attached to the peritoneum pushed inward. Fascia lata, lined on the inside by peritoneal tissue, was transplanted on the outside: it was intact after six months.

(*b*) In a case of *spina bifida* in a child ten days old, the dura was closed; the muscles were brought together as closely as possible, and a flap of fascia lata from the mother was sutured over the muscles and beneath the skin.

(*c*) In *exstrophy of the bladder* a second operation was done, the defect in the abdominal wall being covered in by a flap of fascia lata.

(*d*) In certain cases of *herniorrhaphy* there is not a satisfactory attachment of the conjoined tendon to the spine of the pubic bone, and after the ordinary Coley, Bassini, or Ferguson operation there still remains a weak point: in this type of cases the transplantation of fascia gives good results.

(*e*) In *dural defects* fascia is used with the fat attached.

2. In *transplantation of fat* it is taught that fat is absorbed, but it evidently takes a number of years for this to be brought about. The author has seen fat persisting in cases after twelve years.

3. In a case of *contracted hand after a burn* the palmar fascia and all tendons were involved in the scar tissue. An abdominal pedicled flap was transplanted by the pocket method. The tendons were dissected out and a free flap of fat was placed over and under them. Fat transplants about one-fourth inch in thickness should be used, with but little connective tissue. A number of successful cases of transplants of the hand are described.

4. In *transplantation of bone* the author has never had any difficulty from intramedullary bone transplants from the individual himself: the evidence seems to show that bone from the same individual actually lives.

Digitized by Google

(*a*) He reports a case of *trifacial neuralgia* operated upon to prevent recurrence with good result: the normal foramen through which the nerve emerged was closed by transplanting a plug of bone with the periosteum attached on the outside and cleaning out all connective tissue in the canal.

(*b*) *Fracture of lower end of fifth lumbar vertebra.* Transplants attached to short spines and embedded in section of sacrum, leaving a bridge outside of bone tissue: this is a mistake, as the *entire* transplant should be embedded in bone or beneath periosteum.

5. *Transplantation of parathyroids* is experimental work: results are contradictory. There are two points of difference in highly specialized tissue, in that it does not have the vitality of the lower types of tissue, and we are asking it to take on its own particular function, which perhaps the lower tissue could not do.

Tissue transplanted in connective tissue healed without suppuration in practically every case and *without being lost,* except in two groups of cases—carcinoma of the breast, and bony cavities after osteomyelitis.

G. B. Davis, reporting on *free transplantation of the omentum subcutaneously and within the abdomen* (*Jour. Amer. Med. Assoc.,* 1917, lxviii, 705), experimentally transplanted pieces of omentum varying from 0.5 to 3 inches in diameter to various abdominal organs, areas denuded of peritoneum, and beneath the skin, for the purpose of determining the value and ultimate fate of omental grafts cut loose from their blood supply.

When properly applied, the results were excellent: the omental grafts almost invariably adhered wherever they were transplanted, and remained viable. Wherever a free edge was exposed there was an enormous production of adhesions, but this could be avoided by accurately turning under all raw edges.

Omental grafts or plugs were applied to *severe abrasions and lacerations of the liver and spleen,* and the edges sutured. *The almost immediate hæmostasis was striking.*

J. S. Davis, making a *comparison of the permanence of free transplants of bone and cartilage* (*Ann. Surg.,* 1917, lxv, 170) by the results of experiments on dogs, simulated conditions in actual clinical practice by transplanting the cartilage and bone so that one extremity of the transplant was in close contact with a denuded

Digitized by Google

portion of a membranous bone (as in transplants for saddle-nose), while the remaining portion of the transplant extended into the soft parts.

His experiments were grouped as follows: (1) Cartilaginous rib with perichondrium, and bony rib without periosteum; (2) cartilaginous rib with one-half perichondrium, and bony rib without periosteum; (3) cartilaginous rib without perichondrium, and bony rib without periosteum; (4) cartilaginous rib without perichondrium, and bony rib with one-half periosteum; (5) fibula with its periosteum, and fibula denuded of its periosteum. In his conclusions the author states that transplants of free cartilage were unchanged during the length of time (500 days) under observation, *while free bone transplants under exactly the same conditions either disappeared or showed marked degenerative processes.*

T. P. McMurray contributes a timely article on the *use and abuse of bone-grafts* (*Brit. Med. Jour.*, 1917, ii, 180). The modern technic of bone-grafting follows that of Albee and aims at obtaining a long, solid, unbroken graft consisting of periosteum, compact bone, and marrow. So well does the author's article give the gist of Albee's methods, as well as the latest developments thereof, that it will be abstracted at some length.

The commonest *cause of non-union* is, in all probability, *lack of fixation* of the fracture. A second cause is the *presence of foreign bodies,* either *metal* (*e.g.*, plate), cloth, or such pieces of tissue as muscle or fascia between the fractured ends or at the occurrence of suppuration. A third cause is *loss of bone tissue.* Occasionally non-union is due to some *debilitating process,* and at times there seems to be an *idiosyncrasy.* A fracture can *only be called ununited when it has undergone proper treatment of fixation, venous congestion, and the administration of thyroid extract for a period of three months without the occurrence of union.* If non-union has occurred, the question arises *how long to wait after cessation of the discharge before operating.* Experience has shown that *if the intervening period is less than six months, many of the cases operated upon will become septic,* even when the wound has remained soundly healed without sepsis or infection for some time before operation, and when the strictest asepsis has been carried out at operation.

The graft should be autogenous and may be removed from the

Digitized by Google

tibia or from the lower or upper fragment of fractured bone as a sliding graft: the tibial graft is preferable. The graft should consist of periosteum, compact bone, and marrow, and should be at least two inches longer than the space between the fractured ends. Removal may be accomplished by the use of a twin circular motor saw (Albee motor bone operating outfit) or by a chisel, although *the graft is liable to be split if removed with a chisel.* A bed should be made for the graft in the fractured ends of the bone of sufficient width to receive the graft, so placed that it lies on either fragment for a distance of at least an inch and a half. The graft is anchored by catgut (kangaroo tendon) or small bone-pegs: *no metal should be used, since it acts as a foreign body and leads to atrophy of the bone.*

Fixation of the limb should be continued for *at least two months*—preferably in a plaster-of-Paris case for the whole limb. If union is not firm at the end of two months, the limb should be placed in plaster or splints and treated by fixation and venous congestion (Thomas), with the administration of thyroid extract.

W. Lathrop, discussing the *sliding graft and kangaroo suture in fresh fractures: Albee technic* (*Ann. Surg.*, 1916, lxiv, 68), reports a series of 143 cases of fractures of the femur, tibia and fibula, radius and ulna, and patella: he operated on forty-one of these, with very favorable results in all. He gives a few of the cases in detail and shows radiograms of a number of cases before and after operation. He calls attention to the tendency of the autogenous graft to live and grow in the presence of pus.

The author's *procedure in all fresh fractures* is to take an X-ray on admission, etherize the patient, reduce the fracture, immobilize, and then take several plates to see that the position is good. If, after five to ten days, the limb appears to be in good position, as shown by measurement and examination, it is not interfered with, so far as operation is concerned. If, however, there is deformity or overriding, he does not delay, but cuts down and uses either the kangaroo suture or sliding graft, and puts the limb up in plaster.

In summing up, Lathrop says that from his experience in several hundred cases during the past four years, and *having used wires, plates, nails,* and later the Albee methods, *the latter affords by far the best results.*

L. W. Ely, discussing *ankylosing operations on the spine* (*Jour.*

Digitized by Google

Amer. Med. Assoc., 1917, lxviii, 183), made a histologic study of two spines on which these methods had been done, one by the Hibbs, the other by the Albee method.

The Hibbs method case came to necropsy five months after operation as a result of pulmonary embolism: the spinous processes at the seat of operation had disappeared, and *the union was interlaminar, rather than interspinous.* The ankylosis was almost complete; only a little motion between the bodies of the vertebræ could be detected. The one diseased body was wedge-shaped, with the products of necrosis bulging posteriorly.

The Albee method case came to necropsy two years later and firm union was found: the disease in the body of the vertebra was in process of healing.

The success of the Hibbs operation depends much on the dissection; its object is to immobilize by eliminating the articulation, and not by splinting the vertebræ.

The above extracts show that transplantation of autogenous mesoblastic connective tissue, whether in the form of fat, deep fascia, tendon, cartilage, or bone, as well as autogenous mesothelial tissue (omentum), has at last come into its own and been established upon just as firm a basis as the more time-honored transplantation of epiblastic (skin) and entoblastic (mucous membrane) epithelial tissue. Free fat transplants are useful to ensheath nerves that have been freed from a bed of cicatricial tissue, as well as those in danger of being encroached upon by the same—for example, after nerve-suturing; free fat transplants are also useful in padding out subcutaneous depressed areas for cosmetic purposes—for example, hollows in the cheek from depressed fracture of the malar bone and in the breast after ablation of a benign neoplasm of considerable size. Omentum, which is fat sandwiched between two layers of mesothelial cells (peritoneum), is useful to cover over raw areas of viscera denuded of peritoneum, to seal off and reinforce sutured bowel, and as an effective hæmostatic agent in lacerations of solid organs (liver, spleen): such a graft may be used free or attached to a pedicle. Fat still attached to and lining a deep fascia transplant is useful to tubulize tendons and fill in dural defects. Deep fascia transplants —for which fascia lata is usually employed because convenient— have innumerable applications in the repair of fascia, muscle, or

Digitized by Google

tendon defects, as illustrated in Kanavel's paper. Cartilage—as J. S. Davis has pointed out—is an ideal transplant for special purposes—for example, for saddle-nose deformity. Bone transplants are most effective when used properly, and their field of application is practically without limit. Speaking of the latter, it is interesting to watch the rapidly spreading recognition and adoption of Albee's bone-graft methods under the impetus of the present war, at the same time noting the decline in popularity of metal plates, wires, screws, etc., in bone work. At the March, 1915, meeting of the Philadelphia Academy of Surgery the reviewer, discussing a paper by Doctor Albee on bone-graft surgery, made the following statement: "It is most illogical to put metal into bone: I foresee that Doctor Albee's bone-graft inlay and peg methods have *sounded the knell of all metal fixtures.*" That this is true is illustrated by statements creeping into the literature, of which the following may be taken as an example.

N. G. Bennett, discussing war injuries of the jaws (*Practitioner,* London, 1917, xcix, 201), says: "Of surgical measures there are two possibilities, viz., plating and bone-grafting. Plating is *seldom used.* Bone-grafting, however, has been *quite successfully employed.*"

Douglas, Colebrook, and Fleming, pleading for *more extensive application of skin-grafting* (*Lancet,* 1917, cxciii, 5), state that many wounds do not lend themselves to plastic surgery as a result of extensive loss of skin: it is in these wounds that the healing process can be cut short by skin-grafting. The operation of skin-grafting as suggested in this communication is worthy of wide application. Successful results can be obtained much more constantly; the use of a general anæsthetic is dispensed with; the raw surfaces left after the removal of the grafts, being closed with sutures, heal rapidly and with certainty; the resulting scars are stronger, more elastic, and less prone to ulceration than those resulting from Thiersch grafts or from natural healing of wounds.

In 1869 Reverdin introduced the method of implanting tiny portions of skin upon granulating surfaces to serve as centres of growth.

In 1870 Steele improved upon this by cutting the grafts rather larger and thicker in order to obtain stronger and more elastic scars: his grafts varied in size from the diameter of a pea to that of a three-penny piece.

The authors have revived the Steele grafts, which aim at making

Digitized by Google

the transplantation of skin a reliable procedure with local anæsthesia obtained by blocking certain nerves of the thigh with novocaine: the external cutaneous nerve and at times the anterior crural are blocked with a 2 per cent. solution. By taking a superficial hold of the surface with a towel-holding forceps a small cone of skin is raised which is cut off horizontally through the base of the cone, the graft containing none of the fatty areolar tissue. The graft is then transferred to the wound and flattened out, and the little wound from which the graft is taken is closed with a single shallow stitch. When possible the grafts should be arranged over the wound surface so that less than 8 mm. intervenes between them or between them and the wound edge.

Each graft constitutes a strong point in the scar, the scars from Steele's grafts being less adherent to deeper structures.

Of twenty-two autodermic Steele grafts, 80 to 100 per cent. "took" in twelve, 40 to 80 per cent. in seven, and 5 to 15 per cent. in two: in the remaining case the result was a complete failure.

HÆMOSTASIS

H. R. Oliver, describing the *use of whole blood in hemorrhage* (*Calif. St. J. Med.*, 1917, xv, 13), states that normal serum takes time to separate out and soon becomes inactive by the formation of metathrombin.

To overcome this fault, it has been demonstrated that the most efficient method is to obtain 20 ccm. of blood from the veins of a healthy person by means of a large Luer syringe and inject it immediately into the gluteal muscle of the patient. It is not painful, as the blood soon diffuses, and it leaves no bad results. It is so simple and the results are so striking as to merit attention. The author has used it in six cases of melæna neonatorum with one injection alone, procuring perfect relief and cure. He has used it in other conditions of hemorrhage, as in duodenal ulcer in several instances, after the failure of lactates, horse serum, etc., *with complete cessation of the hemorrhage and rapid recovery;* also in hemorrhage with purpura in tuberculosis pulmonis with the best results.

H. L. Cecil recommends the use of *kephalin to hasten coagulation and hæmostasis after surgical operations* (*Jour. Amer. Med. Assoc.*, 1917, lxviii, 628). The need of hæmostatic gauze where packing

Digitized by Google

is now necessary in deep-seated operations has long been recognized.

Kephalin is made from the brains of hogs. The gauze is prepared as follows: The kephalin is dissolved in an excess of ether—about a 5 per cent. solution being made—and this concentrated kephalin solution is poured over gauze strips 6 feet long and 6 inches wide. The packs are then folded, rolled, wrapped in two muslin covers, and sterilized in the steam autoclave at a temperature of 120° C. for ten minutes. Kephalin causes a quicker and firmer clot. When used after prostatectomy not as much pressure in packing is required to control hemorrhage as when plain or iodoform gauze is used. When the packs are removed, the clot is of sufficient firmness to prevent bleeding.

Kephalin-coated catheters to stop bleeding following Young's "punch" operation were prepared by making a very concentrated solution of kephalin in ether and smearing it on the terminal three inches of a large gum coudé catheter, the tip and eye of the catheter being left uncoated. Whereas previously these patients had frequently to have clots evacuated from the bladder, it was necessary in only one of the cases in which it was used, and in this case the clot was very small, being only large enough to plug the eye of the catheter.

RADIUM AND X-RAYS

W. S. Newcomet contributes a collective review on *the present status of radium* (*Internat. Abstr. Surg.*, September, 1917, 201). This extensive article is based upon 223 references, covering the four-year period from 1913. The most important conclusions follow:

1. In superficial epitheliomata radium should be considered the method of election.

2. There is very little evidence to show that radium or any of these radio-active elements will ever be a specific in the treatment of malignant disease, but it has been proved that radium is and will be a valuable asset in the treatment of the individual malignant case.

3. One of the most convincing arguments that can be offered in regard to the medicinal utility of radium, showing that it has passed the experimental stage, is the number of reports made in the American medical journals by American physicians.

Digitized by Google

Duane and Greenough report the *results of radium treatment* at the Collis P. Huntington Memorial Hospital by the Cancer Commission of Harvard University (*Bost. Med. and Surg. Jour.*, 1917, clxxvii, 359).

Of 642 cases treated with radium in this series, 354—or 55 per cent.—received definite benefit.

In keratoses, papilloma, and other benign skin diseases regarded as precancerous, radium is effective in destroying the clinical manifestations of the disease in from 48 to 60 per cent. of cases.

In the treatment of many other tumors and diseases radium has been used with benefit—depending largely upon the extent of the disease, its depth in the tissues, and the practical ability to apply sufficient radiation to modify or destroy tissue or tumor growth. Among the *conditions in which radium treatment has proved of special value* may be mentioned: Recurrent or inoperable carcinoma of the cervix or body of the uterus; Hodgkin's disease and malignant lymphoma; myelogenous leukæmia; inoperable squamous-cell carcinoma of the tongue, jaw, and buccal mucous membranes; in non-metastasizing epidermoid cancer and in the more benign lesions given above.

Radium therapy has *proved so far to be of little benefit* in recurrent carcinoma of the breast; carcinoma of the stomach and intestines; carcinoma of the glands of the neck by extension from cancer of the tongue, mouth, and lip; and, in general, in deeply seated metastatic extension of cancer from any region.

Many cases of advanced, inoperable, or recurrent cancer may be given benefit by treatment with radium; while in a very small number of cases in these categories improvement may occur such as to permit a radical operation to be performed.

The combination of radium therapy and operation—by which a tumor, otherwise inoperable, is excised as thoroughly as possible, the remaining tissues cauterized, and subsequently subjected to radiation—has yielded satisfactory results in several cases. After a period of radiation and observation of the open granulating wound, extending over several months, secondary plastic operations have been performed to close the defects, and the results, up to the present time, in a very small number of cases, have shown no return of the disease.

C. T. Holland writes on *radiology in clinical medicine and surgery*

Digitized by Google

(*Brit. Med. Jour.*, 1917, i, 285). After giving a historic review of the development of radiology, the author considers the value of X-rays in fractures; thoracic aneurism and other conditions of the thorax; the diagnosis of urinary calculus; the investigation of the stomach and bowel by the opaque meal method; uses in other regions, and the limitations of X-ray diagnosis; and concludes with observations upon the teaching of radiology.

As to *fractures,* no case of suspected bone injury is too trivial for an X-ray examination: it will often disclose an unsuspected condition of affairs which will influence diagnosis and treatment.

Thoracic aneurism in its early stage is discoverable by X-ray, *and by X-ray alone.* As to the diagnosis of other conditions of the thorax, it may be stated generally that *in chest conditions of all kinds an X-ray examination is almost imperative.* There is no doubt that a certain number of patients undergo severe operations for primary growths *in whom at the time of operation there are already secondary deposits* of malignant disease in mediastinal lymph-nodes and in the lung itself: at the Cancer Hospital in London a large number of cases with malignant disease have been thus examined, and it is surprising how large a number show definite lymph-nodes or lung lesions secondary in character. As is well known, such metastases can be present without any symptoms and without giving rise to any physical signs.

As to the *diagnosis of urinary calculus,* the real difficulty is not to *show* shadows, but to *interpret* them. During the author's tenure of office at the Royal Infirmary—nearly twelve years—no stone has ever been found by operation which the radiographic department has failed to show on an X-ray plate.

As to the *limitations of X-ray diagnosis,* many radiologists undoubtedly try to read too much from X-ray plates and screen examinations, and are too much inclined to overestimate the diagnostic possibilities.

ANTISEPTICS

With the war comes the dawn of a new era in antisepsis. Desperate cases of wound sepsis appeared among the wounded, due to the congeries of virulently pathogenic bacterial flora which inhabited the terrain of the combatants through intensive cultivation of the soil before the war. Military surgeons divided themselves into two great

Digitized by Google

schools—those advocating the "physiologic" methods of Sir Almroth Wright, and those the "antiseptic." Among the better known of the latter there are the Carrel-Dakin, the Morison "Bipp" (bismuth subnitrate or carbonate one part, iodoform 2 parts, paraffin in quantity sufficient to make a soft paste), and the flavine compounds (proflavine, acriflavine) and brilliant green of Browning and others in the Bland-Sutton Institute of Pathology. An excellent *critique* of these various methods appears from the pen of Sir Berkeley Moynihan ("American Addresses," W. B. Saunders Company, 1917, 47–72): suffice it to say here that the chlorine compounds which have been derived from the old Labarraque's solution—and which are variously known as eusol, Dakin's solution, and Daufresne's solution—seem to have given, in general, the best results in the treatment of wounds of the present war. We shall present a brief note upon the Carrel-Dakin method and then pass on to a consideration of the antiseptic which we believe will find greatest popularity with the busy surgeon in every-day work, namely, *dichloramine-T*.

J. S. Lawrence takes up the *Carrel treatment of wounds applied to civil practice* (*Bull. Johns Hopkins Hosp.*, 1917, xxviii, 294), offering the following as its advantages:

It successfully checks the extension of the infection, causes an almost immediate drop of temperature, and brings comfort to the patient. Pus is eliminated and dressing simplified. An early opportunity is given for surgical repair work. The production of cicatricial tissue is minimized and interference with the function of the part is less after the recovery of the patient. Finally, it is a scientific and intelligent method of observing the process of healing in wounds and determining the efficacy of treatment.

J. E. Sweet, in an article on *dichloramine-T in the treatment of the wounds of war* (*Jour. Amer. Med. Assoc.*, 1917, lxix, 1076), finds objections to the older chlorine-containing solutions on the grounds that they are not particularly stable and must be prepared with care: further, these solutions contain so little antiseptic value that they must be frequently renewed in the wound. He thus summarizes the advantages of the newer substance in wound treatment:

The amount of solution is of small bulk. The number of wounds which a surgeon can dress in a given time is far greater than by any other method. The elimination of the Carrel tube simplifies the dress-

Digitized by Google

ing and saves the time taken by the nurse for the periodic flushing. It saves the pain of wound dressing and effects an appreciable saving of dressing material.

BURNS

The war has brought out the advantages of *wax dressings for burns.* The first successful substance was *ambrine,* devised by a Frenchman, but not popularized in this country because patented. Other equally good substances were turned out by American pharmaceutic houses—parresine, cerelene, redintol. The mode of application is simple. A layer of wide-meshed paraffined gauze is placed over the burned surface, and upon this film of paraffined gauze is sprayed dichloramine-T oil in 5 per cent. solution. The open mesh allows the oil to come in contact with the wound surface, and also for the wound exudate to escape. No other dressing should be applied, and the usual technic of the open-air treatment of burns should be followed. Depending upon the amount of exudate, the paraffined dressing can be painlessly removed daily or less frequently, as required.

In the treatment of extensive burns of the trunk it is advisable to use a clothes-cradle, spray one of the oily substances over the body, and insert an electric light within the cradle.

HEAD AND NECK

J. M. Ingersoll enthuses over *stereoscopic röntgenograms of the head* (*Trans. Amer. Laryngol. Assoc.,* May, 1917. They are of great practical value in that they give definite information in regard to the nose and the nasal accessory sinuses, the brain and many of its blood-vessels, the ear and the mastoid, which can not be obtained in any other way.

The size and boundaries of the maxillary and frontal sinuses can be distinctly seen: if there are any septa, tumors, or foreign bodies in these cavities, they can be accurately located and defined. The ethmoidal and sphenoidal sinuses overlie each other and are thus somewhat masked, but their position—relative to each other and the orbit and other surrounding structures—can be clearly distinguished.

In studying stereoscopic plates they should be examined from both sides. First, put the plates in the stereoscope with the film sides toward the mirrors: this will show the structures as they are seen in the operation—with the external parts in the foreground

Digitized by Google

and the deeper structures in the background; then by reversing the plates in the stereoscope—turning the smooth sides of the plates toward the mirrors—the structures will be seen from the inside of the skull.

The technic for making stereoscopic anteroposterior radiographs through the frontal sinuses is described, as also the technic for making stereoröntgenograms of both mastoids on a single pair of plates. These plates—when developed—are placed in the stereoscope, with the one having the right-eye images in the right light box, and the one having the left-eye images in the left light box: with the *glass* side of the plates turned toward the mirrors of the stereoscope, the mastoids are viewed *from the inside of the skull;* while with the *film* side placed toward the mirrors the mastoids are viewed *from the outside of the skull.*

H. Lilienthal describes a *method of incising parotid abscess without injury to the facial nerve distribution* (*Amer. Jour. Surg.*, 1917, xxxi, 101). Instead of the long, painful wait for something to happen when suppuration has been recognized in the parotid gland, the author offers prompt relief by an incision, which he claims permits of free drainage and the avoidance of unsightly scars, as well as injury to important branches of the facial nerve.

Technic.—A vertical incision—skin deep—is made in front of the auricle and just as close to it as possible: this incision is extended to the hollow behind the angle of the jaw and thence in a gentle curve forward as far as the projection of the anterior border of the masseter; the flap of skin thus formed is reflected forward, revealing the greater part of the parotid gland, with its overlying fat and fascia. The incisions—as many as are necessary for drainage—may now be made through the parotid fascia into the gland itself, the line radiating in a general way along the course of the pes anserinus: no incision, however, should cross the line of Stensen's duct for fear of salivary fistula. Deeper collections of pus may be evacuated through this same cutaneous incision by puncturing through the fascia behind the ramus of the jaw and then enlarging the opening with the director and dressing forceps. The opening into the parotid may be packed or otherwise drained, the skin-flap not being replaced until healing is well advanced, when it may be held in position with adhesive strips.

F. H. Lahey reports cases of *thyroid abscess; with mention of*

Digitized by Google

two new signs of this condition (*Bost. Med. and Surg. Jour.*, 1917, clxxvi, 94). This rare condition has received little attention in the surgical literature: the cases have usually been confused with cyst of the thyroid.

The author has observed three cases in which, besides the signs of local infection, there were constant characteristic signs which—if noted—should point to the diagnosis; *e.g., limitation of chin elevation and depression of chin toward sternum when swallowing.*

The cause of both these signs is the same; *e.g.*, tightening of the muscles overlying the thyroid by elevation of the chin or contraction of the muscles when swallowing. In either case pressure on the abscess causes pain: the patient therefore attempts to prevent this by keeping the muscles from becoming taut.

In opening the abscess it is important to cut the fibres of the sternohyoid transversely, thus allowing free drainage.

C. G. Cumston reviews *the clinical symptoms and treatment of hypertrophy of the thymus gland* (*Med. Presse and Circ.*, 1917, civ, 140).

The clinical symptoms of hypertrophy are: (1) *functional*, characterized by respiratory disturbances, as persistent dyspnœa, frequent suffocative spasms—usually nocturnal—and occasionally spasms of the glottis and stridulous laryngismus; (2) *physical signs*, as cyanotic facies—increased during paroxysms; distended superficial neck veins during paroxysm or on crying; forward vaulting of manubrium; abnormal and asymmetric forward projection of upper costosternal area and dulness over latter. Radiography aids in the diagnosis.

In the *treatment* radiotherapy may be used. Therapeusis, however, is mainly surgical and may consist of exothymopexy, resection of the manubrium, and thymectomy with intracapsular enucleation—unquestionably the operation of choice.

BONES AND JOINTS

E. A. Rich advocates *the check ligament operation for recurrent dislocations of the shoulder* (*Northwest. Med.*, 1917, xvi, 114), believing the shoulder does not dislocate when the arm is at rest beside the body, and that misplacements occur when abduction extension is carried above the 90-degree arc.

When an accident occurs of sufficient severity to rupture the

Digitized by Google

shoulder-joint capsule and cause dislocation it is also liable to injure the tendons of the overstretched muscles. The most common occurrences are rupture of the supraspinatus, subscapularis, and teres major. The author advocates insertion of a double band of silk ligaments between the scapula and the humerus to restore the unity of action of the shoulder girdle.

(This procedure was first recommended by Galloway, of Winnipeg.)

Technic.—Three inches below the upper end of the humerus—on the posterior and inner surface—two holes on the same plane and half an inch apart are drilled through compact bone. With a sharply curved ligature carrier a strand of very heavy No. 18 Lange silk—prepared in paraffin and bichloride—is drawn into one aperture and out the other. The outer rim of the scapula is exposed at a site about three inches below the spine of that bone, and a hole is drilled through the flat surface just within the rim. The muscular structures between the two incisions are penetrated with a straight ligature carrier: both ends of the silk that have been threaded into the humerus are drawn through the intervening muscles to the rim of the scapula. The arm is abducted to a position about 60 degrees with the body, and, after one strand has been passed through the drilled hole in the scapula, the silk is tied. The silk acts as a check ligament until the engrafting of the periosteum about it is accomplished. A diagram illustrates the method.

Rich states that none of his patients has had recurrence: later they swim and indulge in games, with the exception of hand-ball, volley, and wrestling. He recommends the operation very highly.

W. E. Ladd, discussing *fractures of the lower end of the humerus* (*Bost. Med. and Surg. Jour.,* 1916, clxxv, 220), reports the end-results in forty-five cases in which the records were complete and the skiagrams satisfactory.

These fractures occurred with much greater frequency in the young than in adults. The cases were grouped into fractures of the internal condyle, those of the external condyle, and supracondylar fractures.

The best results were secured in the fractures of the internal condyle. Fractures of the external condyle required operation for replacement of the fragment more often than any other group. The

Digitized by Google

position of acute flexion is most applicable for all fractures of the lower end of the humerus. Early passive motion and massage are not conducive to the best results. Fracture of the lower end of the humerus treated properly should result in a perfect arm in nine cases out of ten and a useful arm in practically every case.

L. C. Rivett introduces *a simple method of putting up fractures in the region of the elbow-joint in the fully flexed position* (*Brit. Med. Jour.*, 1916, ii, 256).

Instead of strapping and bandaging the whole limb and chest, Rivett takes two strips of adhesive plaster 12 x 1.5 inches. The first strip maintains the forearm in full flexion, by encircling the arm just below the axilla, and the forearm just above the wrist, thus not interfering with the circulation. The second strip is applied to the back of the forearm and hand, then placed over the same shoulder and fixed to the back.

I. Calve describes a new *method of bone coaptation by autobolting without graft or metallic sutures* (*Presse Méd.*, 1917, 212): the object is to effect shortening of the shaft of the femur. The most frequent indication for this operation is shortening of a healthy femur where there is accentuated lameness due to considerable inequality in the length of the two limbs, subsequent to a thigh fracture, etc. This procedure—described by Calve in June, 1916—was difficult of execution and required much time.

Calve's new method—autobolting—is very simple and requires less than a quarter of an hour.

Instead of removing a piece of the femur exactly equivalent in length to the amount of shortening required—as in his first method—Calve now removes almost as much, but leaves a piece about 3 Cm. long and equal in width to the diameter of the medullary canal of the upper fragment: this piece is a regular bolt which is introduced into the medullary canal and gives an excellent coaptation of the fragments. If the section of the bone is made obliquely—as shown in the figure—the bolting-in is perfect, the two fragments slide over each other, and a very intimate contact is effected. Even though the upper diaphysis cylinder is not an exact prolongation of the lower one, still parallelism of the two fragments is maintained, the surfaces in contact are extensive, and the lines of force and transmission of pressure are preserved.

Digitized by Google

Ducuing and Uteau also take up *shortening of the healthy femur in certain cases of thigh fractures with extensive shortening* (*Lyon chir.*, 1916, xiii, 814).

Indications.—(1) In cases where there is great shortening by loss of osseous substances; (2) where shortening has been insufficiently ameliorated by a first operation; (3) where there is great shortening by overriding of the osseous extremities; (4) shortening of any kind when accompanied with great lesions of the soft parts.

Contra-indications.—(1) Vicious attitude of the affected limb (rotation, etc.); (2) other lesions of the affected limb which render its use impossible (paralysis, pseudarthrosis); (3) lesions of the healthy limb; (4) the condition of the patient.

R. Jones runs over *disabilities of the knee-joint* (*Brit. Med. Jour.*, 1916, ii, 169), classifying the injuries and outlining their treatment.

For *sprain of the internal lateral ligament*—distinguished by pain and tenderness over the inside of the knee, especially at the attachments of the ligament—he straps the knee firmly and raises the inner side of the shoe-heel to divert the body weight to the outside and relieve tension on the inner side of the knee.

With *rupture of the internal lateral ligament* the internal semilunar cartilage may be pulled loose in severe twists, owing to its close connection with the former. Diagnostic points are: distention with fluid, pain on the inner side of the knee, and tenderness—especially at a point just inside the patellar ligament over the border of the tibia. By way of treatment the knee should be extended on a posterior splint for ten days, after which walking is allowed with a firm bandage over the knee to prevent effusion. After such a cartilage lesion there is sometimes an overgrowth of cicatricial tissue anteriorly which may become pinched in the joint and necessitate operation for its removal.

A completely *displaced semilunar cartilage*—indicated by locking of the joint—may be reduced by placing the patient on his back with the thigh flexed on the abdomen and the knee on the thigh and then, while the patient voluntarily and forcibly extends the leg or kicks, the surgeon pulls on his foot and rotates it inward: the leg is then held in extension for ten days, after which the patient walks with a firm bandage on the knee. If the cartilage continues to give trouble it should be removed. With the knee flexed over the edge of the operating table, a transverse incision is made over the anterior end of

Digitized by Google

the cartilage—far enough forward to avoid the lateral ligament. No fringe of cartilage must be left, as it will cause continuation of the symptoms. The author has treated over 2000 of these cases. The after-treatment consists in immobilization in extension for ten days; then massage and gradual bending are begun.

Rupture of the crucial ligaments may occur with fracture of the spine of the tibia. If the tibia can not be displaced forward while extended, one may be assured that the anterior ligament is not completely torn, and if it can not be displaced backward while flexed, the posterior ligament is presumably not ruptured. Abnormal mobility in these directions indicates elongation or rupture of the corresponding ligament. It is useless to attempt to suture the ligaments. The knee should be fixed in a plaster case or splint long enough to permit the formation of a healing cicatrix.

Fracture of the spine of the tibia is indicated by a rigid obstruction preventing full extension, but should be verified by X-ray examination. If the fragment can be manipulated back between the condyles by fully extending the knee, manipulation with fixation is all that is necessary, but if the knee can not be fully extended, the fragments must be removed by operation.

Swelling of the retropatellar fat pad may follow any knee injury and give rise to symptoms by being caught in the joint on full extension. In such cases a cork under the heel or a brace—either of which will prevent full extension—should be worn until the swelling disappears.

J. L. Thomas contributes a reconsideration of the principles and methods of Hugh Owen Thomas, with *some observations on Thomas's splints and practices* (*Brit. Med. Jour.*, 1917, ii, 175). Neither English nor American authors have given Hugh Owen Thomas credit for evolving an epoch-making contribution to surgery. They have, in addition, committed the blunder of attributing to another man Thomas's method for the treatment of delayed unions of fractures and diseases of joints, known as "Bier's method," but called by its originator "damming the circulation," and employed as early as 1881.

The author refers to Thomas's methods of treating: (1) fracture of the femur; (2) reducing simple backward dislocation of the ankle-joint; (3) setting a Pott's fracture; (4) reducing dislocation of the hip.

Digitized by Google

1. Treatment of *fracture of the femur* in any situation except in the upper third: Thomas maintained that extension alone could not be trusted to obtain proper alignment in a fractured femur, but that the limb should have further support either at the back, the side, or front, or a combination of these. Thomas's knee-splint was made with lateral iron rods of sufficient strength to withstand the forces acting on the limb in three directions; *i.e.,* longitudinal, transverse, and anteroposterior. It is not generally realized what an extraordinary amount of force is often required to prevent the shortening of a femur, nor that sagging deformities of fractures of femurs can be prevented by the application of anteroposterior forces acting upon the side bars of Thomas's splints according to methods he adopted.

2. In *backward dislocation of the ankle-joint* Thomas's method of reduction is carried out with the patient sitting. A bandage passes around patient's leg above the ankle and hangs down in a loop, in which the surgeon places his foot. Another bandage passes in a loop behind the surgeon's neck and around patient's heel. By means of these counter pulls and by manipulation of the foot with the surgeon's hands the dislocation is reduced.

3. In *setting a Pott's fracture* the manner of applying the necessary force and counter force is similar to that for reduction of dislocation of the ankle, except that the counter force attached to the surgeon's foot acts upon the inner aspect of the patient's leg, while the opposing force is applied to the outer aspect of the foot and heel.

4. In *reducing dislocation of the hip* the pelvis is fixed to the ground by a looped towel passing over the patient's groin and under the operator's thigh, the operator grasps the patient's leg and flexes the knee, using the leg as a lever to strain the fixed point—the groin towel. By this arrangement the operator procures much force and is able to perform his flexion, rotation, abduction, and sudden extension.

H. B. Thomas writes on *arthritis and foreign protein: chronic rheumatism relieved by intravenous injections* (*Jour. Amer. Med. Assoc.,* 1917, lxix, 770). Typhoid vaccine is the agent usually employed.

In practically all the cases relief from all joint pains a few hours after the injection is a pleasing effect. The pains usually reappear after an interval of two or three days, but this interval decreases with the number of injections. After a course of from twelve to twenty-

Digitized by Google

four injections, covering a period of from one to two months, the patients are usually cured. In reviewing the end-results, the relief from pain is not permanent in more than 30 per cent. of cases. The remaining cases have done much better under this than under other forms of treatment.

Rest in bed and a search for the focus of infection are the first essentials in treatment. An injection of 50,000,000 typhoid vaccine intravenously is the usual dose in the subacute and chronic cases of osteo-arthritis, and if these cases react moderately, the amount is raised cautiously at intervals of two or three days to 75,000,000 bacteria at each injection.

The immediate effect of the vaccine ranges from an uncomfortable sensation to severe chills, high fever, and emesis: the chronic cases show less reaction. Thomas saw no alarming symptoms or harm done in eighty-six cases.

It is well established that typhoid vaccine does not relieve symptoms by the formation of antibodies, but that the benefit derived is due to the protein content of dead bacteria: this is thought to produce fever, hyperleucocytosis, etc. Thomas's experience coincides with that of Mueller and Weiss: the higher the fever produced, the more favorable the result.

NERVE INJURIES

P. G. Skillern, Jr., proposes *a nerve-anastomosis operation for cure of paralysis of both trapezii muscles* after ablation of cervical lymph-nodes (*Ann. Surg.*, November, 1917, 619). The operation consists of isolating the trapezius branch of the spinal accessory nerve and the suprascapular nerve; splitting the suprascapular nerve, and anastomosing the proximal stump of the split portion of the suprascapular nerve to the distal trapezius stump of the spinal accessory.

The suprascapular nerve, which supplies the supra- and infraspinatus muscles, is in close relationship with the trapezius branch of the spinal accessory as it enters the trapezius muscle. The suprascapular nerve is derived from the fifth and sixth cervical segments; the spinal portion of the spinal accessory is derived in part from the fifth cervical segment. This proposed nerve anastomosis is at least as rational as the anastomosis of the spinal accessory with the facial nerve, and probably more rational, because of the close segmental relationship of the suprascapular and spinal accessory nerves.

Digitized by Google

Duroux and Couvreur, writing on *nerve-sections and restorations* (*Lyon chir.*, 1917, xiv, 515), review the history of nerve-suturing since Flourens made his first attempt in 1827, and present the results of experiments on dogs.

The immediate or early return of function is not the consequence of a real restoration, which always takes place very slowly, and the existence of which can be established only by the thorough penetration of axis cylinders from the central end into the distal peripheral end.

Immediate suture of a divided nerve facilitates restoration by favoring growth of axis cylinders. This proceeds at the rate of about 1 mm. per day, and it may require considerably more than a year to effect complete functional reëstablishment.

Regarding technic of nerve-suturing, the authors recommend a lateral suture. Great attention is given to the previous excision of all scar tissue surrounding the nerve-fibres, as to this may be attributed trophic disturbances. Liberation of the nerve is usually followed by disappearance of such trophic troubles a long time before the return of motor-power. This the authors could verify in some clinical cases.

THORAX: HEART AND PLEURA

J. E. Summers brings up *cardiolysis*—a further report, with notes upon an additional case (*Surg., Gynec. and Obst.*, 1917, xxv, 92). Cardiolysis—the removal of sections of the ribs which imprison the heart in cases of extensive adhesive mediastinopericarditis—was first performed at the suggestion of Brauer, in 1902. The operation is not dangerous, and if performed early will often prolong life for years. The best time to operate is when the apex tug, the diastolic shock, and Broadbent's sign are strikingly characteristic, because these symptoms indicate the struggle of a strong heart muscle imprisoned.

In both cases reported by the author the heart muscle was in an advanced degenerated condition—almost hopelessly so: notwithstanding this, however, one patient—a man—lived four years and ten months; and the second patient lived nearly a year after operation.

Cardiolysis is a valuable operation, as has been proved by the operations—thirty-eight in all—which have been performed abroad, chiefly in England, France, and Germany.

F. Aranda, writing upon *suture of the lung and heart* (*Rev. de méd. y circug. pract.*, 1917, xli, 141), relates the case of a child who

Digitized by Google

was brought to the hospital in a sinking condition, due to a stab wound in the left thoracic region. There were abundant hemorrhage, hemopericardium, and weak cardiac contractions.

An intercostal incision was made by extending the traumatic wound; a further vertical incision was made, resulting in a cruciform opening through the initial lesion. About 4 Cm. of the fifth rib was resected, providing sufficient working space. The index-finger was introduced, and the pericardium was cut with scissors: the pericardial cavity was found to be virtually normal, although much dilated by a large quantity of coagulated blood: this was evacuated. A wound about 3 Cm. long was found in the myocardium of the left ventricle, auriculoventricular septal portion: there was also a wound in the border of the left lung. Aranda sutured both wounds with silk. There was immediate cessation of hemorrhage and of the collapsed condition with strengthening of the cardiac contractions. The opening was closed, leaving a drain. After eight days the patient was able to sit up, and had completely recovered thirty days after the injury.

The reviewer recently had the case of a child who was stabbed with a penknife in the left thoracic region ½ inch to right of nipple. There was external bleeding from divided intercostal vessels. Aside from a fugacious febrile reaction, the patient made an uneventful recovery. No operation was necessary, for there were no signs suggestive of the grave injury suffered in Aranda's case.

H. Lilienthal, taking up *empyema of the thorax* (*Trans. Amer. Surg. Assoc.*, 1917), presents statistics of operative methods looking toward the more rational treatment of empyema.

The main principle of the author's contention is that in addition to evacuating pus from the thoracic cavity the mortality rate should be lowered and the final result should show conservation of lung capacity with symmetry of the chest. He believes that this can be accomplished by what he terms major intercostal thoracotomy, with lung mobilization. In very critical cases major thoracotomy is preceded by minor intercostal thoracotomy and tube drainage without rib resection. About one-third of the cases recover after minor thoracotomy and do not require the major operation. Postoperative röntgenography is valuable in determining which cases require further surgery.

Digitized by Google

As the result of experiences in the theatre of war, surgeons are becoming bolder in invading the thorax for extraction of foreign bodies, to check hemorrhage, and to evacuate the products of hemorrhage. The best work has been done by Pierre Duval, who gives us an excellent means of exposure for exploration of this cavity; namely, resection of the lateral segment of the fourth rib, with wide separation of the remaining ribs (*Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 2876). L. P. de la Villeon extracts intrapulmonary projectiles with forceps under the screen (*Ibid.*, 1889). By his method fifty-eight cases have been operated upon with fifty-eight successes.

ABDOMEN

P. G. Skillern, Jr., reports a case of *stab wound of the deep epigastric artery* (*Ann. Surg.*, 1917, lxv, 450) which occurred in a young girl accidentally stabbed in the abdomen with a penknife.

Cœliotomy revealed division of the deep epigastric artery and blood-clots in the pelvis. The gut was penetrated, but not enough to allow escape of gas. Both ends of the artery were ligated, the clots were removed from the pelvis, and the patient recovered.

Discussing the *surgery of the deep epigastric artery*, Skillern states that it is involved in the following conditions: (1) Stab or gunshot wounds; (2) spontaneous hæmatoma of the rectus muscle; (3) injury in paracentesis abdominis; (4) division during a cœliotomy incision; (5) postoperative secondary hemorrhage, especially in drainage cases; (6) division of anomalous obturator artery when cutting Gimbernat's ligament to relieve the constriction of a strangulated femoral hernia.

D. W. Queen, discussing *the prevention of postoperative gas pains* (*South. Med. Jour.*, 1916, ix, 988), gave quinine in a series of 150 abdominal operative cases by the following method: Quinine muriate, 10 grains in two ounces of water *per rectum* every four hours for four doses, then every six hours for four doses.

The following results were noted: (1) Distention and postoperative gas pains were practically eliminated; (2) nausea and vomiting were greatly reduced; (3) most of the patients had no thirst at all; (4) only one case had to be catheterized; (5) backache was reduced; (6) about 75 per cent. had a normal bowel movement during the first forty-eight hours following operation without having received

Digitized by Google

a purge. Of these 31 per cent. were drainage cases: 5 per cent. had slight distention, and all these occurred in the drainage cases.

R. Hill takes up *posture in abdominal drainage* (*Trans. West. Surg. Assoc.*, December, 1916). There are three recognized positions in treating these cases: (1) The Fowler, (2) the prone, and (3) the lateral.

1. The *Fowler position* tends to throw a decided strain upon a patient with an already weakened heart and lowered blood-pressure. Moreover, as the pelvis is lower than the pubic bones, drainage takes place by siphonage.

2. The *prone position* is carried out by placing the patient on the abdomen with the head of the bed elevated ten or twelve inches. A pillow is placed under the lower part of the chest and one under the head so as to give ample room for breathing. By this position the maximum effects of gravity, intra-abdominal pressure, and capillary attraction are secured. In addition, there are no spaces in the front of the abdomen to favor the formation of pockets, as there are in the pelvis and along the size of the spine.

3. The *lateral position*—in which the patient is placed on the right side in a slightly elevated position—has been proved most efficient.

The author believes that the prone and lateral positions are much superior to the Fowler. In his series of 104 drainage appendix cases, in the fifteen cases treated in the *lateral* position there were no deaths; in the forty-two treated in the *prone* position there were but two deaths; while in the forty-seven cases treated in the Fowler position there were five deaths.

STOMACH, ETC.

E. Rixford considers *acute suppurative cellulitis of the stomach* (*Trans. Amer. Surg. Assoc.*, 1917). This lesion is a streptococcic cellulitis of the submucous areolar tissue of the stomach sharply limited by the pylorus and cardia, strings of leucocytes extending out into the muscle.

The cases are generally divided into two groups: *Primary*—idiopathic, and *secondary*, where the portal of entry is evident.

Clinically the affection begins suddenly with burning pain in the epigastrium—not relieved by drinking or taking food, persistent

Digitized by Google

vomiting, epigastric tenderness, rigidity, leucocytosis 10,000 to 20,000, with high percentage of polymorphonuclears, considerable fever, rapid pulse, early prostration going on rapidly to cyanosis, delirium, death in coma in two to ten days. The mucous membrane may slough and be vomited.

For purposes of *diagnosis and treatment* cases may be divided into three groups: (1) *Localized abscess*—the most favorable; (2) *multiple small abscesses* in the indurated wall of the ulcer or carcinoma; (3) *diffuse cellulitis*—the least favorable. In the first group *drainage* is indicated; in the second, large *partial gastrectomy;* in the third, *total gastrectomy,* or nothing surgical unless intragastric drainage be possible. Medical treatment is merely palliative.

This affection has long been known to pathologists. Its relation to diseases now known to be due to streptococci was recognized as early as 1837 (Dittrich). It was well described by Brinton in 1850. The affection is rare—only about 150 cases being found in all in the literature, but is almost invariably fatal, a few cases of localized abscess recovering after drainage; only one of the diffuse form—that of Koenig—recovered following prompt total gastrectomy.

G. B. Eusterman, writing upon *syphilis of the stomach,* presents a clinical and röntgenologic study with a report of twenty-four cases observed at the Mayo Clinic during the last seven years (*Amer. Jour. Med. Sc.,* 1917, cliii, 21).

After a careful study of these cases the author concludes that the condition is not so rare as is generally supposed. The aid of the Wassermann-Noguchi reaction and the Röntgen rays is necessary to establish the presence and the specificity of the lesion.

The *symptoms* are suggestive of benign ulcer, while the gastric chemistry and Röntgen findings rather suggest carcinoma. Anacidity or achylia is characteristic in the majority of the cases.

The *diagnosis* is based on a history of infection, a consistent positive Wassermann reaction, indisputable evidence of a gross gastric lesion, and (excluding cases of irreparable disease) a permanent cure by purely antisyphilitic measures. Extensive gastric involvement is often present when the gastric disturbance first becomes manifest.

The usual *pathologic picture* is that of a gummatous ulcer—usually multiple—and especially a diffuse syphilitic infiltration, with con-

Digitized by Google

tractures, thickening and perigastric adhesions, chiefly of the pyloric segment.

As to *treatment,* results from antispecific therapy are encouraging in all but very advanced cases. Surgical interference is indicated in some cases. Early diagnosis and intensive treatment invariably result in symptomatic cure and structural improvement.

F. T. Stewart suggests a *method of gastro-enterostomy* (*Trans. Amer. Surg. Assoc.,* 1917).

Technic.—The stomach and the intestine are united with a seroserous suture. The peritoneal coat of the stomach is incised parallel with the suture line, the blood-vessels are caught with hæmostats before being opened, and then the mucous membrane is cut between the rows of forceps. The intestine is treated in similar manner. Each pair of vessels (one gastric, one intestinal) in the posterior wound edges is tied with a single ligature, after drawing the edges together by means of the two forceps (one on the stomach, one on the intestine) in close proximity. The anterior edges also are drawn together by ligatures which invert these edges. The two forceps which lie opposite each other are approximated. The right end of the ligature is passed around the forceps on the intestine from right to left, the left end around the forceps on the stomach from left to right, thus the ends emerge between the forceps beneath the loop of the ligature. The forceps are brought parallel to the long axis of the wound, rolled toward each other, thus inverting the mucosa edges, the ligature is tied, and the forceps are removed. Each succeeding pair of vessels is dealt with in similar manner. The seroserous suture is then continued along the anterior portion of the anastomosis.

This operation is easier to perform and less dangerous than that with clamps. Hæmostasis is assured. A larger anastomosis can be made with the same amount of stomach and intestine than when clamps are used. There is no crushing or contusion.

J. M. Flint describes *the healing of gastro-intestinal anastomoses* (*Ann Surg.,* 1917, lxv, 202). This paper is based upon observations made while working out a method of aseptic intestinal anastomosis, and includes the results of a careful histologic study of a series of gastro-enterostomies.

The clinical bearing of these studies emphasizes the fact that it is well for us to know not only the reaction of the stomach and intestine

Digitized by Google

to the operative traumatism inflicted in performing gastro-enterostomy, but also the reparative process through which the organs pass during the period of healing. One should remember that the new-formed anastomosis is the site of a healing ulcerated surface for a period of fourteen days, and that—for the first five or seven days—the process is largely destructive, at least so far as the mucosa is concerned. This fact should not be lost sight of in feeding these cases for the first two weeks; during this period the diet should be as light as is compatible with the maintenance of the strength of the patient.

A. O. Wilensky takes up *a consideration of the causes of recurrent symptoms after operation for gastric and duodenal ulcer* (*Amer. Jour. Med. Sc.,* 1917, cliv, 387). All postoperative symptoms are not necessarily caused by the persistence of the original ulcer, its recurrence, or similar new ulcerations: they arise much more frequently from other causes.

Symptoms may be due to disturbances in the physiology brought about by new anatomic arrangements: these are usually initiated or aggravated by poorly prepared or ill-suited food. Symptoms are also due to disturbances in healing of the stoma, to badly placed or improperly made stomata, or to partial or complete obliteration of the stoma when the stomach has been unilaterally excluded. Symptoms are due also to associated lesions in other organs; or to lesions in the spinal cord or peripheral nerves, as the vagus. They may also be due to adhesions or herniæ in the abdominal cavity or in the abdominal scar.

On the whole, these symptoms may be classified as arising from an anatomic or functional cause, and frequently it is difficult to make the decision before an exploratory operation is made.

L. L. McArthur points out *the value of a temporary cholecystostomy in gastric surgery* (*J.-Lancet,* 1916, xxxvi, 723; also, *Surg. Clin. of Chicago,* 1917, i, 97). The beneficial results are attributed to the great power the upper intestinal tract has for absorbing fluids: this in turn stimulates peristalsis, overcoming splanchnic stagnation, resulting in a freedom from or relief from those annoying postoperative sequelæ—vomiting, vicious circle, shock, and anuria.

The biliary fistula is formed by means of a purse-string suture, inverting the serous surface of the fundus of the gall-bladder around

Digitized by Google

a rubber tube, and bringing the latter out of the abdomen through a stab wound. Fluid is allowed to flow into this tube by gravity from an elevation of from 12 to 20 inches at a rate of from 5 to 10 drops per second. The biliary fistula may be established in the common duct, and in that case the tube is inserted through the duct well into the duodenum.

Attention is called to the inability of either the cystic or common duct to stand any but neutral or slightly alkaline fluids, and of a density not greater than that of the blood-serum or bile. Among the fluids suggested as appropriate for various conditions are hypotonic solution, mildly alkaline salt solution containing a physiologic dose of adrenalin for shock, or—where food is required—a 2 per cent. dextrose solution, combined or not with any desired liquid peptones, alkalies for acidosis, etc. Excess of liquid introduced gives rise to various œdemas in the lungs, serosæ, and hands and feet.

This method was used with success by Matas in a case of anuria following septic peritonitis, in which he made the first therapeutic biliary fistula through a normal gall-bladder.

G. L. McWhorter describes *gastric and duodenal infusion by means of the duodenal tube—a new procedure in postoperative treatment* (*Jour. Amer. Med. Assoc.*, 1917, lxviii, 1395). The author reviews the literature on the use of the biliary fistula as a means of giving infusion, etc., and the various uses of the duodenal tube. The idea of using infusion through a duodenal tube is new.

The tube may be passed at the time of the operation or by putting the duodenal tube within a stomach-tube, the stomach-tube being passed and then withdrawn, leaving the duodenal tube in the stomach. When the stomach is opened the end of the duodenal tube can be passed into the duodenum, or even into the jejunum. The usual container and drip apparatus are connected and any desired solution may be used. The tube can be disconnected at any time for the purpose of lavage or of aspirating, to determine the absorption.

T. Rovsing makes a *contribution to the pathology, diagnosis, and treatment of chronic duodenal ulcer* (*Hosp. Tid.*, 1917, lx, 621, 645). His report is based on the study of 113 cases.

A duodenal ulcer or a pyloric ulcer or one higher up in the stomach may all show similar symptoms; but if the stomach findings are negative, when there are long-continued symptoms of ulcer it

Digitized by Google

points to a duodenal lesion. Blood in the stools is more frequent in duodenal than in gastric ulcer: this was observed in 74 of the 133 cases. In duodenal ulcer stomach retention is rather rare, but is usual with gastric ulcer. The normal stomach findings may give rise to a wrong diagnosis: Rovsing reports some cases of this type where the troubles were ascribed to hysteria.

R. T. Miller describes *retroperitoneal rupture of the duodenum by blunt force* (*Ann. Surg.*, 1916, lxiv, 550) insufficient to cause injury to the abdominal wall, reviews the cases reported in the literature, and cites one of his own.

The injuries are usually produced by crushing of the bowel against the spine, bursting by increased internal pressure within a loop whose ends are momentarily closed, or tearing of the bowel at a point between a fixed and relatively free section of the gut: rupture of the duodenum forms about 10 per cent. of these injuries, and fully 25 per cent. of these are retroperitoneal. This particular lesion has a mortality of 90 per cent.—due, no doubt, to the obscurity of the lesion—as contrasted with an estimated mortality of 70 per cent. in subcutaneous rupture of the bowel in general. In a series of thirty-seven reported operations by competent surgeons the lesion was missed thirteen times, though operation was undertaken on a diagnosis of probable rupture of the bowel: in contrast to this stands the fact that the findings at operation are distinct and practically pathognomonic.

About one-third of the subcutaneous ruptures of the duodenum occur in its retroduodenal portion and do not communicate with the peritoneal cavity, as a result of the primary injury. The presence of a retroperitoneal hemorrhagic extravasation occupying the root of the transverse mesocolon and more or less of the adjacent region, with a peritoneal cavity which is grossly clean, is practically pathognomonic of traumatic retroperitoneal rupture of the duodenum, and, with the presence of subperitoneal petechial hemorrhages and fat necroses over the ascending colon, transverse colon, and mesocolon, presents a typical picture. In the fatal cases extensive retroperitoneal extravasation is constant and, together with the effects of duodenal fistula and toxæmia, is, in part, responsible for the mortality rate.

The *symptoms* of such a rupture differ from those of intraperitoneal rupture very slightly, except that the onset of severe symptoms is slower.

Digitized by Google

In the *surgical treatment* elaborate procedures should be tabooed, simple suture sufficing when possible. If the gut is badly torn above the papilla the operation of choice is closure of the ends and posterior gastro-enterostomy. In the third portion of the gut it would be best to resect and perform retrocolic duodenojejunostomy.

As regards *methods of approach,* Kocher's mobilization is best suited for the first and second parts of the duodenum: the other two parts are exposed by raising the transverse mesocolon and incising the peritoneum at the base of the posterior leaflet, care being taken to avoid the right and middle colic arteries.

PANCREAS

W. Linder writes on the diagnosis of *acute pancreatitis, with a special study of thirty-three cases* (*Jour. Amer. Med. Assoc.,* 1917, lxix, 718) gathered almost entirely in the short period of three and a half years.

In the first series of sixteen consecutive cases operated upon before June, 1915, there was a mortality of 62.5 per cent.; while in the second series of fifteen cases since June, 1915—the diagnosis having been made in 75 per cent. of the cases—there was a mortality of 13.6 per cent. Errors of diagnosis of this condition are mainly those of omission.

These mortality statistics show the importance of *prompt diagnosis* and *timeliness of operative procedures.*

Operation is indicated in all cases unless shock is extreme, and very rapid operation is of extreme importance. The condition of the patient will determine whether any gall-bladder operation otherwise indicated should be done. The pancreas may be exposed by any one of four routes: (1) Through the gastrohepatic omentum, which is preferable; (2) through the transverse mesocolon; (3) through the gastrocolic omentum, and (4) in the late stages through the left lumbar region. Operation consists of multiple punctures of the pancreas with blunt forceps and drainage of the gland with rubber tissue and gauze, as if it were an acute phlegmon: the omentum is closed around the tube.

The *postoperative course* consists of a strict antidiabetic diet and sodium bicarbonate to reduce the pancreatic secretion. The patient should be kept under supervision for several years, owing to the

Digitized by Google

possibility of recurrences of acute attacks and the development of cyst formations or chronic pancreatitis.

C. A. Morton writes on *acute pancreatitis, with special reference to its treatment* and a record of three cases presenting unusual features (*Bristol M.-Chir. Jour.*, 1917, xxv, 80). In all three cases cited there was a history of recurrent attacks of acute pain in the upper abdomen, simulating gall-stones.

Upon opening the abdomen, areas of fat necrosis in the omentum direct attention to the pancreas, which is usually swollen and hemorrhagic: blood-stained fluid is found in the lesser peritoneal sac.

Suppuration of the pancreas is best drained from behind—a formidable operation: the drain should be to the left of the spine between the top of the left kidney and the spleen, through an incision made below the last rib; only the finger-tips should be used, for fear of injury to the splenic vessels. The drain should not be removed early.

J. B. Deaver, describing *the principles underlying the surgery of the pancreas* (*Bost. Med. and Surg. Jour.*, 1917, clxxvi, 187, and *Jour. Amer. Med. Assoc.*, 1917, lxix, 434), states that the diagnosis is a clinical inference based on the fact that pancreatic disease is associated with biliary disease in from 10 to 30 per cent. of all cases; that it is more often present with long-standing disease and more frequently with common duct involvement than with purely cholecystic inflammations.

Resulting *sinuses* are occasionally troublesome, the effects of the ferments evidencing themselves in the irritation of the skin. A strict antidiabetic diet and bland ointments to the skin are of help.

Free drainage of the pancreas itself is a desideratum: to detect collections of fluid in its substance a large aspirating syringe should be employed. The peritoneum over the organ should be scarified so that gauze drainage may be brought into direct contact with the parenchyma of the organ. The pancreas may also be freely incised in a longitudinal direction. Both gauze and tube drainage should be laid down to the surface of the organ and conducted to the surface of the abdominal wall through an enveloping sheet of rubber dam to minimize adhesions to the stomach and intestines. Abscesses presenting anteriorly rarely adhere to the parietal peritoneum, and must be evacuated transperitoneally, sometimes advisably by a two-stage

Digitized by Google

operation. Acute diffuse peritonitis the result of ultra-acute pancreatitis presents the worst form of the acute abdomen: in these cases it is best to defer operation—until the peritonitis process has become limited—by the observance of strict anatomic and physiologic rest.

The only exceptions to the rule of immediate operation are: (1) In case of severe shock, when sufficient time should be given for recovery under the aid of active stimulation and saline infusion; (2) when the patient at the time observed is obviously improving from the effects of the disease.

The important *practical points in connection with acute pancreatitis* are: (1) The secondary relationship of the disease to preexisting intra-abdominal foci of infection; (2) the lethal character of the toxæmia; (3) the necessity for prompt intervention; and (4) the value of direct and free drainage.

SPLEEN

D. C. Balfour presents a *collective review on the surgery of the spleen* (*Internat. Abstr. Surg.*, January, 1918, 1).

APPENDIX

P. F. Morf writes on *acute appendicitis* (*Jour. Amer. Med. Assoc.*, 1917, lxviii, 902), basing his article upon 822 cases operated upon at the Cook County Hospital from November 11, 1912, to February 22, 1916. Of these, 766 recovered and fifty-eight died—a mortality of a trifle over 7 per cent. From the data given in the tables the following conclusions may be drawn:

1. General peritonitis is still the most frequent complication of acute appendicitis. In a small number of instances a critical study of the clinical history reveals that this complication seems to have been caused by too early removal of the drain in abscess cases. Drainage-tubes, gauze, etc., should be removed gradually to avoid inclusions and subsequent spread of infection.

2. Early operation means low mortality.

3. Abscess formation may be considered evidence of resisting power on the part of the organism.

4. Fecal fistula—while comparatively frequent and annoying—has little importance in increasing mortality.

Digitized by Google

5. Abortion is not greatly to be feared if appendicitis occurs during pregnancy.

J. W. Long writes on *acute appendicitis with peritonitis; cases that should not be drained* (*South. Med. Jour.*, 1917, x, 565).

The author calls attention to the fact that as soon as infection invades the appendix the peritoneum immediately begins pouring out a straw-colored serous fluid, which is rich in antibodies and leucocytes, this fluid being sterile until the infection reaches the free peritoneal cavity: he reasons, therefore, that this protective fluid is of real benefit to the patient in helping to overcome infection, and that its removal takes away a strong protective barrier.

The author hesitates to lay down a fast rule as to when drainage may be omitted, but does not consider a gangrenous appendix, *per se*, a positive indication for drainage: he rather depends on the morale of the patient. In very questionable cases he advocates drainage, and drainage always in thrombosis of the appendiceal vessels. A large quantity of fluid indicates omitting drainage, the character and odor of the effusion being the determining factors.

Digitized by Google

Digitized by Google

INDEX TO VOLUME I

(TWENTY-EIGHTH SERIES)

A

Abdomen, surgery of, 283
Abdominal drainage, posture for, 284
    surgery under local anæsthesia, 259
Abscess, parotid, 273
        and facial nerve, 273
    thyroid, new signs of, 273
Adenitis, cervical, 20
        foci of infection in, 20
    tuberculous, 22, 23
Albee technic, 264
Allen treatment of diabetes, 249
Amputation of cervix, 32
Anæmia, aplastic, 254
    pernicious, 255
Anæsthesia, 258
    local, 258, 259
        advantages of, 260
        complications in, 260
        disadvantages, 260
        contra-indications, 260
    nerve blocking, 258
    regional, 258
    spinal, 260
Aneurism, thoracic, 270
Aniline poisoning, 199
Ankle-joint, backward dislocation of, 279
Antiseptics, 270
Aortitis, syphilitic, 232
Appendicitis, acute, 292
        peritonitis in, 293
    local anæsthesia in, 259
Appendix, 292
Arthritic purpura, 97
Arthritis, classification of, 99
    foreign protein for, 279
Asthma, bronchial, 225
Asthmatic condition, chronic, due to food poisoning, 7
Auricular fibrillation, 238
Autogenous transplantation of living tissue, 261

B

Beau's lines, 118
Bisch, Louis E., 131
Bishop, Louis Faugeres, 1
Bladder, exstrophy of, 261
Blood in vaccinated typhoid patients, 214
    -pressure, 239
        tobacco and, 241
Bone coaptation by autobolting, 276
    grafts, 263
    transplantation, 261
    transplants, 262
Bones and joints, 274
Brain hemorrhage, 90
    hernia of, 91
    injuries to, in warfare, 74
Brass founders' ague, 199
Bronchial asthma, 225
Brown, Philip King, 98
Burn, contracted hand after, 261
Burns, 177, 272
    dichloramine-T for, 177
    method of preparing dressings for, 178
    wax dressings for, 272

C

Calculus, kidney, 65
    ureteral, 69
Camphor in cardiovascular disease, 241
Canities unguium, 108
Carbuncles, dichloramine-T for, 175
Carcinoma, radium for, 269
Cardiolysis, 285
Carrel-Dakin method, 271
Cartilage, displaced semilunar, 277
    transplants of, 262
Cerebrospinal meningitis, 210
Cervical adenitis, foci of infection in, 20
Cervicitis, chronic, 27
Cervix, amputation of, 32
Chemotherapy in tuberculosis, 222
Chlorcosane, 180
    preparation of, 180
Cholecystostomy in gastric surgery, 287
Chorea, 150
Cirrhosis of liver, 233
Clubbed fingers, 122
Complement-fixation test in tuberculosis, 223
Craig, Frank A., 197
Cranium and brain, injuries to, in warfare, 74
Criminal mind, 131
Crucial ligaments, rupture of, 278
Cumston, Charles Greene, 74

D

Dementia præcox, 151
Diabetes mellitus, 248
        Allen treatment of, 249
        coma in, 251
        diagnosis of, 249
        fat in, 250
        renal function in, 251
    insipidus, 252
    phlorizin, 250

Digitized by Google

Dichloramine-T, 174, 271
Digitalis, 10, 11, 238, 241
Diphtheria, 231
Dispensary for non-pulmonary tuberculosis, 16
Duodenal infusion, 288
    tube, 288
    ulcer, 287
        diagnosis of, 288
        pathology of, 288
        treatment of, 288
Duodenum, traumatic rupture of, 289

E

Elbow-joint, fractures about, 276
Employment for tuberculous patients, 225
Empyema, 282
Epididymectomy, 59
Epididymis, tuberculosis of, 59
Epigastric artery, deep, surgery of, 283
Epilepsy, 149
Ethylhydrocuprein, 221
Exstrophy of bladder, 261

F

Fascia, transplantation of, 261
Fat, rôle of, in diabetes, 250
    transplantation of, 261
Female, sterility in, 41, 47
Femur, fracture of, 279
    shortening of, 277
Fingers, clubbed, 122
Food poisoning, 7
Fowler's position, 284
Fracture of femur, 279
    of humerus, lower end of, 275
    of lumbar vertebræ, 262
    of skull, depressed, 88
    of spine of tibia, 278
    Pott's, 279
    ununited, 263
Fractures about elbow-joint, 276
    fresh, 264
        Albee technic in, 264
        kangaroo suture in, 264
    of thigh, shortening after, 277
    X-rays in, 270
Funk, Elmer H., 102

G

Gastrectomy, 285
Gastric infusion, 288
    surgery, cholecystostomy in, 287
    ulcer, 287
Gastro-enterostomy, 286
    intestinal anastomosis, 286
Gout, 98
Gynæcologic clinic, 27

H

Hæmaturia, renal, bilateral, 54
Hæmophilia, 254
Hawes, John B., 2d, 16
Hemorrhage, brain, 90
    kephalin for, 267
    whole blood for, 267
Hemorrhagic diseases, 253
Hæmostasis, 267
Head injuries, complications of, 89
    stereoscopic röntgenograms of, 272
    surgery of, 272
    wounds of, from projectiles, 74
        prevention of, 83
Heart-disease, 1, 236
        history taking in, 1
        suffocative œdema of, 8
    murmurs, 236
        four in one subject, 5
    strain in soldiers, 237
    surgery of, 281
    suture of, 281
Heliotherapy, 20
Hernia of brain, 91
    of lung, 102
        types of, 103
    ventral, 261
Hip, dislocation of, 279
Humerus, fracture of lower end of, 275
Hypertension, cardiac, 240
    cerebral, 240
Hysterectomy, 27

I

Impregnation, artificial, 49
Industrial medicine, 197
    poisons, 199, 200
Infantile paralysis, 203
Insane, therapeutic use of occupation for, 139
Insemination, uterine, 49
Intestines, syphilis of, 233

J

Jaundice, infectious, 229
Joint affections, 93
        complications of, 95
    sarcoma of, 101
Joints, bones and, 274

K

Kangaroo suture in fresh fractures, 264
Kephalin for hemorrhage, 267
Kidney calculus, 65
    contracted, and hypertrophy of heart, 246
Knee-joint, disabilities of, 277
    sprain of, 277
Kretschmer, Herman L., 54

Digitized by Google

L

Labey, Frank H., 65
Lee, W. Estell, 174
Lespinasse, Victor D., 47
Leuconychia, 108
acuta, 117
chronica, 117
etiology of, 116
hair and scalp in, 118
incomplete, 110
pathology of, 116
striata, 118
totalis, 108
Leucorrhœa, 34
Leukæmia, 256
Liver, cirrhosis of, 233
laceration of, 262
syphilis of, 233
Luetic joints, 98
Lumbar puncture in pneumonia, 222
vertebræ, fracture of, 262
Lung and heart, suture of, 281
hernia of, 102

M

Male, sterility in, 47
Medicine, industrial, 197
review of, 197
Men, types of, 143
Meningitis, epidemic, 240
Meningo-encephalitis, 90
Mercuric chloride poisoning, 200
Murmurs, heart, 236
Murphy, John P. H., 139

N

Nails, congenital ingrowing, 130
incurved, 122
pathologic conditions of, 108
transverse grooving of, 118
Neck, surgery of, 272
Neosalvarsan, 235
Nephritis, 242
etiology of, 245
trench, 246
Nerve-anastomosis, 280
injuries, 280
suturing, 281
Neuralgia, trifacial, 262
Neurology, 131
Novocaine in spinal anæsthesia, 260

O

Occupation for insane, 139
Œdema, causes of, 244
pulmonary, in pneumonia, 222
Omentum, transplantation of, 262
Optochin, 221

P

Pancreas, surgery of, 290, 291
suppuration of, 291
Pancreatitis, 290
Paralysis, infantile, 203
of both trapezii muscles,
of nerve, anastomosis for, 280
Parathyroids, transplantation of, 262
Paratyphoid, 212
carriers, 216
vaccination against, 212
Parotid abscess, 273
and facial nerve, 273
Pathologic conditions of nails, 108
Pellagra, 256
Peritonitis in appendicitis, 293
Pertussis, 230
vaccines for, 230
Phenolsulphonephthalein test, 243
Phlorizin diabetes, 250
Pituitary extract in diabetes insipidus, 253
Pleura, surgery of, 281
Pneumonia, lobar, 218
lumbar puncture in, 222
pulmonary œdema in, 222
serum for, 219
Pneumonocele, 102
treatment of, 106
Pneumothorax, artificial, in tuberculosis, 224, 225
Poisoning, anilin, 199
mercuric chloride, 200
Poisons, industrial, 199, 200
Polak, John Osborn, 27
Poliomyelitis, 203
Postoperative gas pains, 283
Pott's fracture, 279
Prostate, enlarged, 62
Psychopathic laboratory, 133
Public health, 156, 197
Pulmonary hypertrophic osteo-arthropathy, 100, 123, 130
œdema in pneumonia, 222
Purpura, arthritic, 97
hemorrhagic, 254

Q

Quinine for postoperative gas poisons, 283

R

Radium, 268
in malignant disease, 269
present status of, 268
results of treatment with, 269
Renal calculus, 65
function, 242
hæmaturia, bilateral, 54
tuberculosis, 28
bilateral, 26
Retropatellar fat, swelling of, 278
Rheumatism, chronic, typhoid vaccine for, 279

Digitized by Google

S

Salpingitis, 44
spontaneous cure of, 44
Salvarsan, 235
Sarcoma of joint, 101
Serum for pneumonia, 219
Sex hygiene and its teaching, 156–173
Shoulder, recurrent dislocation of, 274
Skillern, P. G., Jr., 197
Skin grafting, 266
Skull, depressed fracture of, 88
treatment of, 88
fissures of, 88
penetrating wounds of, 84
Sodium chloride excretion, 244
Soldiers, heart strain in, 237
Spina bifida, 261
Spinal anæsthesia, 260
Spine, ankylosing operations on, 264
Spleen, surgery of, 292
laceration of, 262
Sprains of internal lateral ligament of knee, 277
Steinhardt, I. D., 156
Stereoscopic röntgenograms of head, 272
Sterility, 41, 47
in female, 41, 47
in male, 47
Stomach, suppurative cellulitis of, 284
surgery of, 284
syphilis of, 233, 285
Streptococcus viridans in chronic endocarditis, 239
Suture of lung and heart, 281
Syphilis, 232
aortitis in, 232
joints in, 98
of intestines, 233
of liver, 233
of stomach, 233, 285
treatment of, 235
visceral, 232

T

Therapeutic use of occupation, 139
Thomas's splints, 278
Thoracic aneurism, 270
Thorax, surgery of, 281
Thymus gland, hypertrophy of, 274
Thyroid abscess, 273
new signs of, 273
Tobacco, effect of, on blood-pressure, 241
Transplantation of living tissue, 261
Treatment of burns, 177
carbuncle, 175
shell and gunshot wounds, 183
syphilis, 235
wounds of head from projectiles, 74
Trench fever, 228
nephritis, 246
Trinitrotoluene, 200
Tuberculin, 19
Tuberculosis, non-pulmonary, 16
dispensary for, 16
illustrative cases in, 22
results in, 21
of epididymis, 59
of uterus and appendages, 22
pulmonary, 222
artificial pneumothorax in, 224, 225
chemotherapy in, 222
complement-fixation in, 223
employment in, 225
renal, 23
bilateral, 26
Tuberculous adenitis, 22, 23
Typhoid carriers, 216
fever, 212
vaccination for, 212
vaccines for, 215
Typhus fever, 217

U

Ulcer, duodenal, 287, 288
gastric, 287
Ureteral calculus, 69
Urinary calculus, 270
Uterine insemination, 49
Uterus and appendages, tuberculosis of, 22

V

Vaccination against typhoid, 212
paratyphoid, 212
Vaccines for pertussis, 230
for typhoid, 212
Ventral hernia, 261
Visceral syphilis, 232

W

Warfare, injuries to brain in, 74
Wassermann test, 234
Whooping-cough, 230
vaccines for, 230
Wounds, anfractuous, expectant treatment of, 186
freely open, treatment of, 184
head, prevention of, 83
infected, dichloramine-T for, 174
penetrating, of skull, 84
shell and gunshot, 183

X

X-ray diagnosis, limitations of, 270
X-rays, 268

MAR 2 5 1918

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

UNIVERSITY OF MICHIGAN
3 9015 07037 1557

Digitized by Google

Digitized by Google